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BULLETIN

University College

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Northeastern University
Part-time Undergraduate Programs

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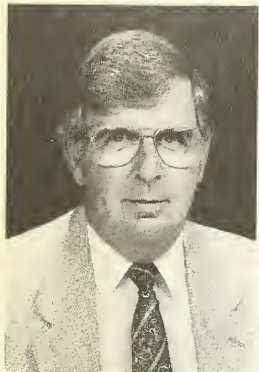
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A Letter from the Dean



...The Remarkable Part-time Division of Northeastern University

*John W. Jordan
Dean, University College*

It is a pleasure each year to welcome you to University College and to tell you a little bit about this remarkable institution.

You, the adult students, are the most remarkable part of University College. Your ongoing quest for improvement, your thirst for enrichment, and your stoic tenacity are nothing less than inspirational. We understand the juggling you do and the stresses you endure. We admire the courage it takes to come back to school and keep at it. We are familiar with your dreams and aspirations, and we are dedicated to helping you get to where you want to be.

You bring out the best in us, and that has led us to the top position we hold in continuing higher education. In fact, we are called University College because we embody the best of two academic worlds. As an integral part of a great university, we provide you with the energies and resources of a multifaceted, dynamic institution. As a pioneer in adult education we bring you a "can-do" spirit, infused with creativity, academic vitality and practical savvy. We have been providing education to adult students for a long time and believe we understand your needs and tailor our programs accordingly.

Our programs reflect the premium we place on quality and innovation. Comprised of a full array of credit degree and certificate programs and non-credit professional development programs, they are constantly evaluated and updated to respond to the changing professional needs and personal interests of adult learners. In response to your requests for graduate program offerings, we now have several graduate certificate programs which may be of interest to those of you who have already earned a bachelor's degree. I urge you to read the details about our Banking and Financial Services, Human Resources Management and Service Industry Security programs on pages 66-71 of this Bulletin.

By combining your plans and ideas with our programs, you can set your sights in any direction at University College—at the undergraduate or noncredit, and now at the graduate level. Consider this Bulletin one of many road maps available to you at University College and our faculty, advisors, and administrators your mentors and guides. It bears repeating: you are what is most remarkable about University College, and we will always be here for you.

Good luck!

John W. Jordan

1996-1997 Academic Calendar

Fall Quarter "In-Person" Registration Dates for Classes that begin Tuesday, September 24

Boston - Main

Tuesday-Friday	September 3-6	9:30 a.m.-7:00 p.m.
Saturday	September 7	9:00 a.m.-12:00 noon
Monday-Wednesday	September 9-11	9:30 a.m.-7:00 p.m.

Boston - Downtown

Tuesday-Thursday	September 3-5	11:00 a.m.-7:00 p.m.
Monday-Tuesday	September 9-10	11:00 a.m.-7:00 p.m.

Burlington

Wednesday-Thursday	September 4-5	5:30-7:30 p.m.
Monday-Tuesday	September 9-10	5:30-7:30 p.m.

Dedham

Wednesday and Monday	September 4 & 9	5:30-7:30 p.m.
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Framingham

Tuesday and Monday	September 3 & 9	5:30-7:30 p.m.
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Marshfield

Thursday and Tuesday	September 5 & 10	5:30-7:30 p.m.
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Milford

Thursday and Tuesday	September 5 & 10	5:30-7:30 p.m.
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Westwood

Thursday and Tuesday	September 5 & 10	5:30-7:30 p.m.
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Weymouth

Wednesday and Monday	September 4 & 9	5:30-7:30 p.m.
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Fall: Special Dates

Columbus Day observed:
Monday, October 14

Veteran's Day observed:
Monday, November 11

Thanksgiving Recess:
Wednesday-Saturday
November 27-30

**Monday classes meet
Tuesday, November 26
as a make-up day.**
Tuesday classes do not
meet November 26.

Snow make-up days:
December 16 and
December 17, if necessary

Final Examination Period:
Monday-Saturday
December 9-14

Holidays Observed:
Monday-Sunday
December 16-January 5

Winter Quarter "In-Person" Registration Dates for Classes that begin Monday, January 6

Boston - Main		
Monday-Thursday	December 2-5	9:30 a.m.-7:00 p.m.
Boston - Downtown		
Monday-Wednesday	December 2-4	11:00 a.m.-7:00 p.m.
Burlington		
Monday-Wednesday	December 2-4	5:30-7:30 p.m.
Dedham		
Monday-Wednesday	December 2-4	5:30-7:30 p.m.
Framingham		
Monday-Tuesday	December 2-3	5:30-7:30 p.m.
Marshfield		
Tuesday	December 3	5:30-7:30 p.m.
Milford		
Tuesday	December 3	5:30-7:30 p.m.
Westwood		
Monday-Wednesday	December 2-4	5:30-7:30 p.m.
Weymouth		
Monday-Wednesday	December 2-4	5:30-7:30 p.m.

Winter: Special Dates

Martin Luther King, Jr.'s Birthday observed:
Monday, January 20

Final Examination Period:
Tuesday-Monday
March 11-17

Monday classes end:
March 17

Snow make-up days:
March 18 and March 19,
if necessary

Winter Recess:
Tuesday, March 18-
Saturday, March 22

Spring Quarter "In-Person" Registration Dates for Classes that begin Monday, March 24

Boston - Main		
Monday-Thursday	March 3-6	9:30 a.m.-7:00 p.m.
Boston - Downtown		
Monday-Wednesday	March 3-5	11:00 a.m.-7:00 p.m.
Burlington		
Monday-Wednesday	March 3-5	5:30-7:30 p.m.
Dedham		
Monday-Wednesday	March 3-5	5:30-7:30 p.m.
Framingham		
Monday-Wednesday	March 3-5	5:30-7:30 p.m.
Marshfield		
Tuesday	March 4	5:30-7:30 p.m.
Milford		
Tuesday	March 4	5:30-7:30 p.m.
Westwood		
Monday-Wednesday	March 3-5	5:30-7:30 p.m.
Weymouth		
Monday-Wednesday	March 3-5	5:30-7:30 p.m.

Spring: Special Dates

Memorial Day observed:
Monday, May 26

Final Examination Period:
Monday-Saturday
June 2-7

Commencement:
Saturday, June 14

Summer Quarter "In-Person" Registration Dates for Classes that begin Monday, June 9

Registration for entire Summer Quarter:

Boston-Main

Tuesday-Thursday May 27-29 9:30 a.m.-7:00 p.m.

Boston-Downtown

Tuesday-Wednesday May 27-28 11:00 a.m.-7:00 p.m.

Burlington

Tuesday-Wednesday May 27-28 5:30-7:30 p.m.

Dedham

Tuesday May 27 5:30-7:30 p.m.

Second Summer Quarter "In-Person" Registration Dates for Classes that begin Monday, July 14

Registration for second five-week term:

Boston-Main

Monday-Tuesday June 30-July 1 9:30 a.m.-7:00 p.m.

Boston-Downtown

Monday-Tuesday June 30-July 1 11:00 a.m.-7:00 p.m.

Burlington

Monday June 30 5:30-7:30 p.m.

Dedham

Monday June 30 5:30-7:30 p.m.

Summer: Special Dates

Independence Day
observed:

Friday, July 4

Labor Day observed:

Monday, September 1

Final Examination Period:

Last class session of
each term

We're Here to Help You.

Programs That Work For You

Naturally, Northeastern University offers all the traditional academic programs you expect from a large university, including timely and innovative programs in **Business Administration, Criminal Justice and Security, Health Professions and Sciences, and Liberal Arts**. Among these programs are **five bachelor's degree concentrations in business** that carry the extra prestige of full accreditation by the American Assembly of Collegiate Schools of Business.

Many students come to Northeastern University to take specific, job-related courses or to prepare for professional licensing exams. To serve these students, we have developed more than **forty credit certificate and special programs**. In most cases, these programs incorporate or build on the major concentration courses required in each of our professionally focused undergraduate degree programs. New this year are several concentrated graduate-level certificate programs designed to enhance your skills in the industry-specific areas of Banking, Human Resources, and Security. In addition, for students in non-credit professional development, the Center for Continuing Education offers programs on information technology, software engineering, networking and communications, paralegal studies, insurance and financial services, building design and management, and environmental management.

Northeastern also offers practical, part-time **associate degree programs** for students who are seeking a first-rate, first-level college degree, as well as **bachelor's degrees** in all four areas: Business Administration, Criminal Justice and Security, Health Professions and Sciences, and Liberal Arts.

The "Write" Skills To Empower You

The purpose of University College has always been to provide the adult student with educational opportunities designed to enrich personal and interpersonal experiences and to prepare the student for success in his or her chosen field. This purpose is, of necessity, many-faceted, and often quite career-specific. Nevertheless it is our belief that every University College experience should rest on a strong foundation of communication skills and that writing skills in particular should be cultivated continually as critical to each student's overall progress. We believe that writing can be singled out for such universal attention because a student who has learned to write well has also learned to think clearly, and therefore has learned how to learn. Writing is a skill that transcends subject area, a tool that can be brought to bear in any situation, with the inevitable result of affording each student continuing self-respect and the respect of others.

This is why we are determined to make University College "The Write Place," that is, a place where our students will be given every opportunity to improve their writing skills and to employ them as tools for success in their academic, professional, and personal lives. We understand the need our students have to gain an edge in a complex society, and we have developed the "write" means to help them attain such an advantage. Some call this Write Place campaign "a vehicle for empowerment." As true as that may be, we prefer to consider it as our tribute to the creative potential of our students.



...Get to Where You Want To Be

Faculty Steeped in Knowledge and Experience

A course is only as good as its teacher. That's why University College carefully selects both full-time Northeastern University faculty and practicing professionals from other academic institutions as well as a wide array of specialized fields for its teaching staff of 1,000. Bringing an extra dimension into our classrooms are corporate executive officers, published authors, established health professionals, law enforcement officers, artists, graphic designers, computer experts, lawyers, professors, and others. They offer students the benefit of their experience and current information about how careers in their fields are changing. Many have found teaching adults particularly rewarding and have expressed their pleasure at having such committed, hard-working, and enthusiastic students.

Students Who Bring Rich Experiences to Class

Approximately 12,000 adults come to University College every year to pursue a degree, update their careers with a certificate, or take a course in a subject that has long interested them. These adult students range in age from 18 to 80 and come from all walks of life: women re-entering the work force, young men and women seeking to start new careers, older people polishing their skills, people of every age intent on finishing an education that time or circumstances interrupted. All have one thing in common—they are making a change in their lives through their own actions, expanding their world by investing in themselves. This diversity is a source of stimulation and enrichment for all—students, faculty, and administration alike.

Schedules "in Sync" With Your Lifestyle

We know you're busy, and finding the time to continue your education can be a real challenge. To help you out, Northeastern not only schedules classes at **ten different locations** in eastern Massachusetts, but also provides different course formats. While most courses are offered on a ten to eleven week schedule, some courses are offered in five and six week formats to accommodate the complex lives of many adults. For **those of you who would like to accelerate** the educational process, University College offers numerous **intensive courses** which are generally equivalent to two regular courses. These intensives can be found on our schedules almost every night and on weekends, and they are available at a **reduced tuition rate**. Most recently, we have added the ACCEL program to our offerings. Now available for the BSBA Management, BSBA MIS and BS Liberal Arts/Business Minor, the ACCEL program gives students the opportunity to complete these degrees primarily on Friday evenings and Saturdays at the Boston and Burlington campuses. While these programs may not be for everyone because of the heavy course load, we provide them in response to your requests for ways to complete degree programs faster.

Class Size Conducive to Learning

Everyone knows Northeastern is big. What many people don't realize is that because we operate at ten different locations, our classes tend to be small. And many of our specialized degree and certificate programs enroll only small numbers of students because of their unique focus. Last year, our average class size was twelve students. Many classes ran with fewer students, and only 10 percent of all classes offered ran with enrollments larger than twenty-seven.

Advising, Career Services, and Counseling

Counseling and Career Search Activities To Bring Your Plans Into Focus

As we move to the brink of the 21st century, making decisions about your career and the education you need to support your career goals has become complex. The world of work is changing rapidly. University College offers a wide range of career and academic counseling services to assist you in making both educational and career decisions. The College provides academic advisors and career counselors, offers credit and noncredit career-planning programs, and serves as a link to other student support services offered by Northeastern University.

Open House Programs

If you are thinking about enrolling in University College for the first time, you are encouraged to attend an Open House. Open Houses introduce potential students to the many University College programs and services designed to meet educational, job-related, and personal needs. They also orient new students to the University as a whole and address concerns that many adult, part-time students have about transfer credit, international student applications, course selection, career decision making, admission to degree programs, certificate programs, and financial aid.

Students currently enrolled in University College are also invited to attend an Open House. Open Houses are ordinarily scheduled each quarter at selected campus sites at or about the same time that registration takes place. Details appear in the *Schedule Guide* for each term.

Academic Advising

Academic advisors are available by appointment to talk with University College students and prospective students about courses, transfer credit, degree requirements, career counseling referrals, and other matters of individual concern. Persons requiring any support services such as a sign language interpreter should mention this at the time the appointment is being made. Please refer to information on the Disabilities Resource Center for further information.

For academic advising questions, use e-mail for an answer:

uc-academic-affairs@lynx.dac.neu.edu

To make an appointment at a specific campus, please call the appropriate number, as listed below.

- *Main Boston Campus:* Advisors are available weekdays from 8:30 a.m. to 7 p.m. Call 617-373-2400 or TTY 617-373-2825 (for Deaf or hard of hearing).
- *Burlington Suburban Campus:* Call 617-373-2400. (**Note:** this is a Boston campus phone number)
- *Downtown Boston Campus* (89 Broad Street): Call 617-373-8300.
- *All other branch locations:* Advisors are available for scheduled appointments. Call 617-373-4291 for an appointment.

During registration, the advising staff in Boston is available to meet with students on a walk-in basis from 9 a.m. to 7 p.m. Students may also call in with questions during these times. In addition, registration advisors are available at satellite campuses during most registration hours to assist students with course selection and to explain registration procedures.

Tutorial Services

University College offers tutorial assistance in several subjects. Tutoring, which is on a one-to-one basis, provides an opportunity for student and tutor to focus on specific problems that might not have been covered during class time. You may request tutorial information from the Office of Academic and Student Affairs, 617-373-8300. A flyer describing tutorial services is also available at all campus locations.

Career Services to Guide You Through Your Next Transition

The workplace has undergone tremendous change in the last several years. Global competition has become intense; computer and telecommunication technology has exploded; downsizing and re-engineering of business and government organizations have dramatically altered worksettings; and increased use of temporary and contract workers has shifted the very definition of employment. Meanwhile, the workforce is undergoing its own transformation. No longer guaranteed secure employment, workers are insisting on meaningful work, work that is personally satisfying, work that makes a contribution to society.

Career Development Courses

The responsibility for managing one's career has landed squarely with the individual. Success in today's market requires continuously updated skills, an entrepreneurial spirit, a customer orientation, and a network of contacts. University College offers several credit courses in career development to prepare adults for the workplace of the 21st century. In these courses, described on page 173-174 of this *Bulletin*, students develop valuable skills to manage careers over the lifespan.

Career Services

The **Department of Career Services** assists all students, alumni and members of the Northeastern University community in developing and implementing successful career plans. A career redirection team of three counselors trained in the career transition needs of adults is available for all University College students. Recent trends (including global economy, downsizing, new technology, and outsourcing) have changed the world of work. The ability to project, prepare for and manage change will determine your career success. For information about available services, contact:

Northeastern University
Department of Career Services
P.O. Box 895
Boston, MA 02117
617-373-2430

Location: 101 Stearns Center, Main Boston Campus
Office Hours: Sept.-June: 8:30 a.m.-4:30 p.m., Monday-Friday
Summer Quarter: 8:00 a.m.-5:00 p.m., Monday and Thursday
8:00 a.m.-7:00 p.m., Tuesday and Wednesday

In addition, the **Career Resource Center**, located in 103 Stearns Center, is open until 7:00 p.m. most Tuesday and Wednesday evenings for counseling appointments and general use of print, video, and computer resources.

Career Counseling

Career counseling is available to help matriculated students make sound career decisions. Depending on individual needs, career counseling might include planning a career or a career change, making decisions, setting short and long term goals, developing effective job search strategies or participating in videotaped mock interviews. Students decide with the counselor whether they need one or more sessions. Career counseling is by appointment in Boston, Dedham, Downtown Boston at Batterymarch, or Burlington and may be arranged by calling 617-373-2430, TTY 617-373-2432.

Professional Development Seminars

Whether you are a seasoned job hunter or a beginner, seminars are designed to prepare you to compete effectively in today's market. Meeting the demands of the current marketplace, seminar topics include self-assessment, the latest in job search strategies, how to target your resume and write dynamic cover letters, and how to prepare for successful interviewing. Seminars are offered during day and evening hours throughout the year. Since space is limited, advanced registration is required.

Evening seminars take place in Boston, Burlington, and Dedham, and are announced in classes prior to the start of each series. Current seminar offerings are also listed on our homepage on the World Wide Web; the internet address is http://www.neu.edu/career_services. Students who wish to participate in these seminars must reserve a place by calling the Department of Career Services at 617-373-2428, TTY 617-373-2432.

Career Resource Center

The Career Resource Center, located in 103 Stearns, provides a variety of services and resources:

- a book collection containing occupational information, resume and interviewing resources, job search guides and directories of employers and graduate schools;
- a Job Bank containing current local, national, and international job opportunities and internships;
- employer videos and files containing annual reports, product information and descriptions of entry-level position and training programs;
- daily walk-in hours for assistance with resumes and correspondence;
- computer access to on-line job search resources available on the internet.

Career Expos and Networking Events

University College students are welcome to attend Career Expos and networking events. This year's events will include a major Career Expo. Students will have the opportunity to meet informally with prospective employers and alumni/ae to discuss career options and job opportunities.

On-Campus Recruiting

All students receiving a bachelor's degree in the current academic year are eligible to interview with organizations recruiting on campus. Organizations typically range from larger international corporations to smaller non-profit organizations. The fall and winter recruiting seasons attract 250 employers who conduct over 3,000 interviews. Lists of participating employers are available at the start of the quarter.

Resume Matching

The Department of Career Services maintains a database of seniors and alumni/ae who are looking for career opportunities. When employers notify us of professional vacancies, they often ask us to refer eligible candidates. Resumes of all candidates meeting the qualifications specified by the employer are forwarded for consideration. Employers then contact the candidates they wish to interview.

Northeastern National Career Network

The Northeastern National Career Network (NNCN) is a voluntary organization of Northeastern alumni/ae and other professional affiliates who are willing to share information on their career fields. NNCN members offer insight into industry trends, their own career experiences, an overview of their field and information on job opportunities. Whether you are an undergraduate trying to focus on your career direction or an alumnus/alumna or graduate student making a career change, NNCN members are an extremely valuable source of information and contacts. The NNCN materials are located in the Career Resource Center, 103 Stearns.

Reciprocity

The Department of Career Services establishes reciprocal agreements with colleges and universities throughout the country to provide career assistance to our alumni/ae relocating outside of Massachusetts. We will write up to three letters on your behalf to other schools.

For additional information, contact the Department of Career Services at 617-373-2430, TTY 617-373-2432.

The Counseling Center

Students can receive confidential counseling to address personal, educational, or career concerns. Assistance is available to all students during days and some evening hours at the Counseling Center. For information and appointments, call 617-373-2142 or drop in at 302 Ell Building.

Individual and Group Counseling

People come to the Center for help with a variety of personal concerns. Anxiety and depression, academic problems, personal or family relationship problems, drug and alcohol abuse, and sexual concerns are among the issues that University College students may want to discuss with a professional therapist. The Center is committed to short-term therapy, with a maximum of twelve counseling sessions per year. If the Center cannot meet your needs, appropriate referrals are provided. The Center also offers a number of therapy groups that help students to address relationship and interpersonal problems. All counseling is confidential and protected to the full extent of the law. The Center does not provide services that require court testimony or involve litigation.

Alcohol Prevention and Other Programming

The Center also offers an alcohol/other substance abuse prevention program that includes various peer programs such as Helpline and a Theatre group that presents skits on these issues to various student groups.

Videotapes of Study Skills and Procrastination Workshops may be viewed at the Center. Other workshops and groups focus on Stress Management, Surviving Family Conflict, and Relationship Issues.

Career Testing and Counseling

With so many fields to choose from, students sometimes have difficulty selecting a major or a career, or individuals may be returning to school and considering a career change. At the Center, vocational counseling usually involves an evaluation of your interests, aptitudes, abilities, values, and personality characteristics. Many kinds of tests, available at the Center, may be used in this process.

National Testing Center

The Center also administers many national tests. Information and application packets for such standardized tests as the GRE, LSAT, GMAT, MAT, and CLEP exams are available at the Center. CLEP exams are given at the Center ten times each year to NU students, and the Center is also a national testing site for the MAT (Miller Analogies Test). Call 617-373-2142 for information.

The Disability Resource Center

The Disability Resource Center's (DRC) mission within the University is to enable people with disabilities or who are Deaf or hard of hearing equal access to higher education via support services and advocacy. The Center provides support services on an individual basis. Accommodations include but are not limited to: orientation, academic and general counseling, and approval of HP parking.

Prior to receiving services, individuals who have both visible and hidden disabilities or who are Deaf or hard of hearing must voluntarily request to register their disability-related needs by opening a file with the DRC. Registering with the DRC is done by providing the DRC with recent diagnostic documentation of the disability. During the Center's registration process, services are individually designed to meet the student's needs. Support services are available for the following disability groups' needs but are not limited to: students who are learning disabled; students who are head injured; students who have mobility disabilities or are wheelchair users; students who are Deaf or hard of hearing; students who are blind or visually disabled; students with degenerative or chronic conditions and students with mental health disorders.

The Disability Resource Center meets with student organizations such as the Disabled Student Organization of Northeastern University and the Deaf Club. Call 617-373-2675 or TTY 617-373-2730 for assistance.

University College Offices

- **General Information**
617-373-2400
TTY: 617-373-2825 (for the Deaf only)
fax: 617-373-2325
- **Office of the Registrar**
120 Hayden Hall
617-373-2300
TTY: 617-373-5360
fax: 617-373-5351
Monday-Thursday,
8:00 a.m.-7:00 p.m.
Friday, 8:30 a.m.-4:30 p.m.
- **Boston Main Campus**
180 Ryder Hall
360 Huntington Avenue
617-373-2400
TTY: 617-373-2825
(for the Deaf only)
fax: 617-373-2325
Monday-Friday,
8:30 a.m.-8:30 p.m.
Saturday, 8:30 a.m.-1:30 p.m.
- **Downtown Boston Campus**
Batterymarch Building
89 Broad Street
617-373-8300
fax: 617-373-8307
Monday-Thursday,
7:00 a.m.-10:00 p.m.*
Friday, 8:30 a.m.-4:30 p.m.*
Saturday, 8:30 a.m.-1:30 p.m.
- **Burlington Suburban Campus**
145 South Bedford Street
617-238-8400
fax: 617-238-8433
Monday-Friday, 8:00 a.m.-10:00 p.m.
Saturday, 8:00 a.m.-12:00 noon
- **Burlington High School**
123 Cambridge Street
617-270-1838
Monday-Thursday,
5:30-10:00 p.m.
- **Dedham Campus**
Common Street
617-320-8000
Monday-Thursday,
8:00 a.m.-10:00 p.m.
Friday, 8:30 a.m.-4:30 p.m.
Saturday, 8:00 a.m.-1:00 p.m.
- **Framingham High School**
A Street
508-877-2333
Monday, Tuesday, & Thursday,
5:30-10:00 p.m.
- **Marshfield High School**
Forest Street
617-837-1835
Tuesday & Thursday, 5:30-10:00 p.m.
- **Milford High School**
31 West Fountain Street
508-473-2565
Tuesday & Thursday, 5:30-10:00 p.m.
- **Westwood High School**
200 Nahatan Street
617-329-3030
Monday, Tuesday, & Wednesday,
5:30-10:00 p.m.
- **Weymouth Junior High School**
360 Pleasant Street
617-335-9112
Monday-Thursday, 5:30-10:00 p.m.

*Office hours may vary due to changes in class schedules.

<http://www.neu.edu/uc/>

Summer Office Hours

- **Office of the Registrar**
120 Hayden Hall
Monday-Thursday,
8:00 a.m.-7:00 p.m.
- **Boston Main Campus**
180 Ryder Hall
Monday-Thursday,
8:00 a.m.-8:30 p.m.
- **Downtown Boston Campus**
Batterymarch Building
89 Broad Street
Monday-Thursday,
7:30 a.m.-10:00 p.m.*
- **Burlington Suburban Campus**
145 South Bedford Street
Monday-Thursday,
8:00 a.m.-10:00 p.m.
- **Dedham Campus**
Common Street
Monday-Thursday,
8:30 a.m.-10:00 p.m.
- **Framingham High School**
A Street
Tuesday and Thursday,
5:30-10:00 p.m.
- **Weymouth Junior High School**
360 Pleasant Street
Tuesday and Thursday,
5:30-10:00 p.m.

*Office hours may vary due to
changes in class schedules.

Policies and Procedures

Admissions

University College has an open enrollment policy that enables students to take most courses and certificate programs simply by registering for the course. Applications for admission, entrance examinations, and College Board Examination scores are not required. Credits earned for individual courses taken at University College may be applied to a certificate or degree program.

However, students who are enrolled at University College and who decide to pursue a degree program must apply for admission to the program. Requirements include proof of high school graduation, a 2.0 q.p.a., completion of 18 q.h., and completion of the Critical Writing sequence. Special requirements apply to students entering degree programs such as the Associate in Science in Radiologic Technology, the Bachelor of Science in Business Administration, and Bachelor of Science in Nursing programs. For information on the admissions process for these programs, please see pages, 124-5, 75, and 121 respectively.

Students must be admitted to a degree program in order to be eligible for financial aid. See page 265-266 for information on obtaining financial aid. All international students must be admitted to a degree program in order to apply for an I-20 form. See page 17 for more information on international students. There is a separate procedure for entering Certificate programs. See page 38.

Both degree and nondegree students are entitled to make use of the student support services offered by University College. Call 617-373-2400 or TTY 617-373-2825 for more information.

Registration

Students may register for courses by telephoning, or by mailing or faxing the registration form available in the back of the *Schedule Guide* during the mail-in registration period or by reporting to any University College campus during the registration periods that are scheduled each quarter. It is not necessary to register at the campus where a particular course actually meets; students may register at any campus for a course scheduled at any other campus. Attendance at class, even with the instructor's permission, does not constitute registration unless the student has filled out a registration form. **To assure academic soundness, students may not register for courses after the second class meeting**, except in rare cases by special permission of the instructor. Academic credit will not be awarded to students who are not properly registered. See the Academic Calendar on pages 3-5 for a complete registration schedule.

Courses listed in this *Bulletin* are not necessarily offered each quarter. *Students may not be able to take all of the courses required for a particular program at any one campus location.* Each Fall, Winter, Spring, and Summer quarter the list of courses being offered is printed in a University College *Schedule Guide*. *Schedule Guides* are distributed at all campus locations several weeks prior to registration. To request a schedule by mail, call 617-373-2400 or TTY 617-373-2825.

Course Selection

Academic advisors (see page 8) are available by appointment at all campuses to help students plan their academic programs and select courses.

Students who have earned credits from other schools are urged to have their transcripts evaluated prior to the registration period to avoid duplicating coursework completed elsewhere. Students should allow *at least four weeks from the time all transcripts have been received for processing transfer credit petitions.* During the official registration

periods at all campuses, advisors are available without an appointment to answer general questions and to help students make initial course selections. Because the process of evaluating transfer credit is complex, students should not expect advisors to evaluate their petitions during advising appointments.

Attendance

University College expects students to meet attendance requirements in all courses to qualify for credit. Attendance requirements vary, and it is the student's responsibility to ascertain what each instructor requires. Absence from regularly scheduled classes may seriously affect the student's academic standing. If a student is consistently absent without having made arrangements with the instructor, the instructor may take this to mean that the student has withdrawn and may issue a final grade of "W." Permission to make up work missed because of absence may be granted by the instructor on presentation of a reasonable excuse.

Auditing Policy

Students are permitted to audit courses upon submitting the usual registration forms and on paying the regular tuition fees. There is no reduction in fees for auditing. An auditor may participate in class discussion, complete papers and projects, and take tests and examinations for informal evaluation. However, regardless of the amount or quality of work completed, *academic credit will not be granted at any time for an audited course.*

The student's decision to audit a course must be communicated in writing to the Registrar's Office prior to the fourth class meeting. Exceptions to this procedure cannot be approved without authorization by the University College Associate Director of Academic and Student Affairs.

Change of Address or Name

Change of address and/or name should be reported in writing both to the Registrar's Office, 120 Hayden Hall, Northeastern University, 360 Huntington Avenue, Boston, MA 02115, and to the Office of Academic and Student Affairs, 180 Ryder Hall. Legal documentation must accompany requests for name changes.

Class Changes

University College reserves the right to cancel, divide, or combine classes when necessary. Although this policy ensures that students in most cases will not be excluded from a class because it is oversubscribed, it also means that a course may be cancelled because of inadequate enrollment. Cancellations are more likely to occur among upper-level or advanced courses than among introductory courses. While students may register as late as the first week of class, cancellation decisions are based on pre-registration figures. *You are therefore encouraged to register in advance to increase the likelihood that the courses you want will run.* Seniors who are adversely affected by course cancellations should contact an academic advisor or their program office for help in identifying alternatives.

Credit Hours: Quarter-Hour Credit

Credit hours are assigned to a course based on the established educational standard of one credit hour for every three hours of student learning time per week over a term. Thus one hour of lecture or discussion plus two hours of individual study outside of class equals one credit.

Northeastern University operates on a quarter-hour credit system. A quarter-hour credit is the equivalent of three quarters of a semester hour. Most University College courses are assigned three quarter hours (abbreviated "q.h.") of credit and meet for two hours and ten minutes each week.

Students who would like to take courses at Northeastern and then transfer these credits to another school are urged to receive permission from an advisor at the other school prior to registering, especially since many other schools operate on a semester calendar.

Examinations

Tests are scheduled throughout each quarter at the option of the instructor and are regarded as part of the term's coursework. A final examination is held at the end of each quarter in each course unless an announcement is made to the contrary. The procedure for making up final examinations missed due to student absence may be found on page 31.

Homework

The specific work required for each course in University College is determined by the instructor. In general, University College students are expected to spend an average of six to eight hours per week outside of class on assignments for each course. Students who are absent are responsible for obtaining their homework assignments from their instructors or from other students. Homework assignments are not available from the Office of Academic and Student Affairs.

International Students

Northeastern University is authorized under Federal law to enroll *non-immigrant alien* students. International Student Applications must be filed by all non-immigrant students. Because the process of applying to University College is complex, deadlines for completed applications are well in advance of the start of each term:

<i>Deadline</i>	<i>for</i>	<i>Term Starting</i>
July 3, 1996		Sept. 1996 (Fall)
Oct. 4, 1996		Jan. 1997 (Winter)
Jan. 3, 1997		March 1997 (Spring)
April 4, 1997		June 1997 (Summer)

Students who miss the deadline for a given term will need to defer attendance to the following term. Proficiency in English is a prerequisite to admission and is determined by achieving a 550 on the TOEFL exam, by an assessment interview or by testing administered by the English Language Center. There is also an application fee of \$75.00.

Questions may be directed to the Office of Academic and Student Affairs, 180 Ryder Hall, 617-373-2400 (TTY 617-373-2825) or to the International Student Office, 203 Ell Building, 617-373-2310.

International students who are *resident aliens* in the U.S. must file an International Credentials Evaluation Form for admission and/or transfer credit and must provide proof of their resident alien status (green card). There is an evaluation fee of \$45.00 if international high school and college transcripts are involved. Questions may be directed to the Office of Academic and Student Affairs. (See page 27, Evaluation of International Educational Credentials, for further details.)

Course Load Policy

It is *recommended* that new students and/or students who are working full-time not take more than 12 quarter hours of credit per term. The *average* course load for a student working full-time is 6 q.h. per term. Students who are not working, or whose work schedules allow, may take up to 18 q.h. per term without special permission. Any student wishing to take more than 18 q.h. in a given term must file a course overload petition with the Office of Academic and Student Affairs *at least one week prior to the start of the term*. In no case may a student with a quality point average under 2.0 take more than 12 q.h. per term.

Petition for Course Overload forms are available from the Office of Academic and Student Affairs, 180 Ryder Hall, 617-373-2400 or TTY 617-373-2825.

Pass/Fail Courses

Students may register for one *open elective* course per quarter on a pass/fail basis and may not take more than a total of five pass/fail courses at University College. To be eligible for pass/fail status, the student must be in good academic standing (have at least a 2.0 quality-point average) and must also meet all prerequisites for the course.

To be graded on a pass/fail basis, the student must file a Pass/Fail Petition and have it signed by the Associate Director of Academic and Student Affairs. Pass/Fail Petitions are available from the Office of Academic and Student Affairs, 180 Ryder Hall, 617-373-2400 or TTY 617-373-2825. Petitions must be *received prior to the fourth class meeting*. Please see also the section on Pass/Fail Grades, page 31.

Placement Tests

Placement tests are given to students enrolled in *Critical Writing 1* (ENG 4100), *Writing for the Professions 1* (ENG 4380), and *Technical Writing 1* (TCC 4101) during the first class session. Some students may be requested to register for *Elements of Writing* (ENG 4011), a three-quarter-hour course offering additional help in writing, or advanced *English for International Students* (ENG 4007).

Students registering for *Contemporary Algebra 1* (MTH 4110) or *Contemporary Algebra 1 and 2 Combination* (MTH 4114) must take a placement test on the first night of class. The results will determine whether the student should take *Introduction to Mathematics 1 and 2* (MTH 4001 and MTH 4002) prior to taking *Contemporary Algebra 1*. Students registering for *College Algebra 1* (MTH 4107) must also take a placement test at the first class meeting. Some students may be asked to register for *Technical Mathematics* (MTH 4006) to help improve their math skills. Placement tests are also given at the first class meeting of *MIS 4278 C++ for C Programmers*. Students may be asked to take a C Programming class to improve skills.

Prerequisites

Before registering for a course, you should read the course description in this *Bulletin* to determine if you need to have taken a prerequisite course. In order to ensure academic success, students are strongly advised to adhere to course prerequisites. Students with questions about prerequisites should contact the program office that administers the course or speak directly to the instructor. Students must have 80 q.h. in order to register for reserved section business courses. Students must have 130 q.h. to register for *Business Policy* (MGT 4450, 4451, or 4452).

Special Students

University College students who wish to take Basic College courses may, in certain instances, enroll on a term-by-term basis. These students must obtain prior approval from **both** the Office of the Dean of the college offering the course and University

College's Office of Academic and Student Affairs, 180 Ryder Hall. Students must collect both signatures on a Special Registration Form and submit the form to the Registrar's Office. Tuition is charged at the Basic College rate.

Basic College students who wish to enroll in University College courses must obtain prior approval from the academic dean of their college.

Withdrawal Policy

Students who wish to withdraw from a course *must* complete a Course Drop Form, available at any campus location or drop their class by using the automated telephone system (617-373-8000). Students who withdraw from a course prior to the end of the seventh week of a term (please refer to the specific deadline in each *Schedule Guide*) will have no record of the withdrawal on their transcripts. Students may withdraw from the beginning of the eighth week to the end of the week prior to final examinations but the withdrawal *will be* noted on their transcripts. No withdrawals will be allowed for any reason during the week in which final examinations are given.

Academic Integrity

Students must accept the responsibility to be honest and to respect ethical standards in meeting their academic assignments and requirements. Integrity in academic life requires that students demonstrate intellectual and academic achievement independent of all assistance except that authorized by the instructor. Consequently, *all* work submitted to meet course requirements, whether it takes the form of papers, examinations, laboratory reports, computer projects, quizzes, or any other work assigned, is expected to be the student's own work produced specifically for each course.

Students who fail to meet the responsibility of academic integrity as defined here are subject to disciplinary sanctions ranging from a reduction in grade or failure in the assignment or course to dismissal from the University. Details on the Code of Student conduct and complete disciplinary procedures are outlined in the University College *Student Handbook*.

Academic Monitoring

Student grades are monitored at least once each academic year, usually after the end of spring term. Nondegree students, undeclared majors, and unadmitted students whose quality-point averages fall below 2.0 are contacted by the Office of Academic and Student Affairs and are offered all possible assistance. These students may also be subject to academic review, probation, and dismissal from University College when such action is warranted.

Students who feel they would benefit from academic assistance are encouraged to work closely with an academic advisor. Students may make appointments by calling 617-373-2400 or TTY 617-373-2825.

Academic Standing Committee

The University College Academic Standing Committee convenes at least once each month, and more often if necessary, to consider student academic grievances and appeals related to the academic policies and procedures contained in this *Bulletin*. The Committee has the power to dismiss students who do not meet the academic standards of University College. Complete procedures are outlined in the University College *Student Handbook*. Grievance letters may be addressed to the Dean's Office, University College, 295 Ryder Hall.

Disciplinary Action

The University Court has the authority to warn, censure, suspend, expel, or remove from the list of degree candidates any student who, because of disruptive, threatening, or illegal conduct or poor character, is considered an unsuitable member of the College community. The University Court is convened to hear a case when a member of the University College community charges a student with a violation of the Code of Student Conduct. Complete procedures are contained in the *University College Student Handbook*, which can be obtained at all campus locations or by calling 617-373-2400 or TTY 617-373-2825.

Student Records

In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits students to inspect their records whenever appropriate and to challenge specific parts of them when they feel it is necessary. Specific details of the law as it applies to Northeastern are available in the *University College Student Handbook*.

Students' Rights and Responsibilities

The University subscribes to the view that all students have certain rights, freedoms and responsibilities. For these reasons, the University has adopted and published specific policies and procedures governing student rights and freedoms, general conduct, student discipline, grievance procedures, disclosure of information from student records, and University judicial procedures. Judicial and grievance procedures are related to issues of discipline and conduct, the right of students to appeal judgments of their academic performance, grievances based on the fact that a student is handicapped, and allegations of sexual harassment. All policies and procedures governing the above matters may be found in the *University College Student Handbook*. Copies are available in the Office of Academic and Student Affairs or by calling 617-373-2400 or TTY 617-373-2825. In general, copies are also available at each campus location.

Degree Program Policies and Procedures

Applying for Admission to a Degree Program

A student who wishes to be admitted to University College as a degree candidate must follow either Option 1 or Option 2 procedures as outlined here.

Students are urged to apply for admission as soon as they are eligible. Students *must* be admitted to a degree program in order to be eligible for financial aid. The admission process must be completed before the start of the term for which financial aid is being applied. Non-immigrant international students must also be admitted to a degree program and must follow the procedures outlined on page 17, International Students. International students who are resident aliens must follow the procedures outlined on page 27, Evaluation of International Educational Credentials.

Option 1

In general, students who want to apply for admission to a degree program must have:

- completed at least eighteen quarter hours of credit, which may include transfer credit, and *must* include English courses ENG 4100, ENG 4111, and ENG 4112 or their equivalents;
- attained a minimum grade-point average of at least 2.0 (C) at University College (i.e. successfully completed at least one U.C. course); and
- provided (or submitted) a high school transcript, diploma or a high school equivalency certificate (GED).

In addition to the above requirements,

- Students who wish to apply to a Bachelor of Science in Business Administration (BSBA) degree program must also have completed 80 q.h. of credit, MTH 4110 and 4111 (Contemporary Algebra 1 and 2 or their equivalents), and one social science course.
- Students who wish to apply to the Bachelor of Science in Nursing (BSN) degree program should also note the additional admission requirements on page 121.
- Students who wish to apply to the Associate in Science in Radiologic Technology must file special application materials with the Radiologic Technology Office (617-373-2818).

Students who meet these requirements may file an application for admission in the Office of Academic and Student Affairs or at any branch campus. Applications may also be submitted by mail. Call 617- 373-2400 or TTY 617-373-2825 to obtain an application. Students will be notified of their acceptance by mail.

Option 2

Students who must apply for admission but do not meet the above requirements should:

- arrange an admission interview with an academic advisor by calling 617-373-2400 or TTY 617-373-2825, (617-373-8300 Downtown; 617-373-2400 Burlington and other satellite locations);
- complete an Option 2 application for admission and bring it to the interview;
- bring an official copy of the high school transcript or GED certificate to the interview; and
- bring official copies of any college transcripts to the interview.

Interviews may be arranged at all campus locations.

Bachelor of Science in Business Administration (BSBA) candidates are not eligible for admission under Option 2. These students will be placed in Associate degree programs until they have met the Option 1 requirements for the BSBA degrees.

Students who have been admitted to a degree program under Option 2 will have their transcripts reviewed after one academic year to ensure that they are making satisfactory academic progress. Satisfactory academic progress is defined as follows:

- completion of at least eighteen quarter hours of University College or transfer credit. This credit *must* include English courses ENG 4100, ENG 4111, ENG 4112, or their equivalents, and
- a minimum grade-point average of at least 2.0 (C) at University College.

The Office of Academic and Student Affairs will notify the Office of Financial Aid of those students who are not making satisfactory academic progress. Students who have not completed the above requirements within one year will be reverted to unadmitted status.

Academic Probation

All students are monitored at least once each academic year, usually after the end of spring term. Students majoring in Nursing are also reviewed on a quarterly basis by the Academic Standing Committee of the College of Nursing. Students in the Radiologic Technology Program are monitored on a continuing basis. Radiologic Technology students whose grades fall below acceptable levels are subject to sanctions imposed by the Program Director and may be asked to leave the program without a probationary period. Students who have been admitted to a degree program must maintain an overall quality-point average of not less than 2.0 (C) and a 2.0 (C) average in the required major courses in order to be considered in good academic standing. Any degree student whose overall quality-point average or major course average falls below 2.0 is placed on academic probation for a one-year period. Students receive formal notification of their probation and the level of performance required to return them to good academic standing. Students on probation are encouraged to meet with their assigned advisor at least once per term.

Students who do not raise their overall quality-point average or major concentration to 2.0 within the probationary period will have their cases referred to the University College Academic Standing Committee for review. This Committee has the power to remove students from their degree programs but allow them to continue taking courses at University College, or to dismiss them from University College.

Students who have been dismissed from University College must petition the Academic Standing Committee no sooner than one year from the date of dismissal if they wish to return to University College.

Additional Degree Status

Any student who has received a bachelor's degree from University College and wishes to earn a second bachelor's degree must fulfill an additional 45 quarter hours in residence after full completion of the first degree, at least 12 quarter hours of which must be in the new major concentration. At present, dual undergraduate degrees or dual majors are not available at University College.

A student who has already received an associate's or bachelor's degree from University College and who wishes to earn a second degree at the associate's level must fulfill an additional 24 quarter hours in residence after full completion of the first degree, at least 6 quarter hours of which must be in the new major concentration.

In either case, the additional degree and major must be distinctly different from the previously conferred degree. This policy does not apply to students earning an associate's degree who wish to go on for a bachelor's degree. Students interested in additional degree status are urged to first meet with an academic advisor.

Certificates Contained within Degrees

When a certificate is contained within a degree program (such as economics or graphic design), the grouping of certificate courses is treated like all other courses in terms of overall and major quality point average and the student receives a diploma only. However, if the student wishes to receive both a diploma and a certificate, the higher standard for certificate courses (minimum 2.0 in each certificate course) will apply. Students must file a certificate completion petition separately in order to receive the certificate.

Change of Major

Students wishing to change majors within University College should file a Change of Major Petition with the Office of Academic and Student Affairs, 180 Ryder Hall. Petitions are available at all campus locations or by calling 617-373-2400 or TTY 617-373-2825. Students who have received an associate's degree who are now working toward a bachelor's degree should be sure to change their majors to their new programs.

Changes in Requirements

The continuing development of University College requires frequent revisions. When no undue and unusual hardship is imposed on students because of these changes, students are expected to meet the requirements of the most current *Bulletin*. If a particular student finds it impossible to meet those requirements, the *Bulletin* for the year in which he or she declared a major is binding. University College makes every effort to inform students who are admitted to a degree program of changes in the curriculum.

Academic programs, course content, and rules and regulations are subject to change without notice.

Course Substitutions

Students may request to replace a required course in an academic program with another comparable course. Although such requests are not encouraged, the University recognizes that students may occasionally have very good reasons for requesting such substitutions. Students must complete a Petition for Course Substitutions and submit it to the Office of Academic and Student Affairs. Petitions are available at each campus location or by calling 617-373-2400 or TTY 617-373-2825. Petitions are routinely forwarded to the appropriate program director. The program director reviews the request and notifies the student of the outcome. A copy of the completed request is kept in the student's file in the Office of Academic and Student Affairs.

Dean's List

All degree candidates who have taken a minimum of 18 quarter hours during the fall, winter, spring, and summer quarters, and who have completed this coursework with a quality-point average of 3.25 or better with no "I" grades, grades below C-, and no pass-fail grades (except where there is no alternative or where required by the program) are placed on the Dean's List. These students receive certificates of commendation from the Dean of University College after the summer quarter has ended. See page 33 for information on graduation with honor.

In Absentia Status

If a student moves beyond a reasonable commuting distance from University College or its branch campuses and has completed one hundred thirty-five or more quarter hours of credit (at least 75 q.h. of which must have been taken at University College), the Associate Director of Academic and Student Affairs will consider a petition to allow the student to complete his or her requirements for a University College degree at another approved college. The remaining courses must be completed within two years of the date of official *in absentia* status approval. The student must submit course descriptions to the Associate Director for approval prior to taking the courses.

Status Reports

The Office of Academic and Student Affairs provides status reports for students who want to know where they stand in a particular academic program. Status Report Request forms are available at all campus locations and by calling 617-373-2400 or TTY 617-373-2825.

No more than one status report for the same program will be issued to a student in a given academic year. Requests are processed on a rolling basis. Status reports are issued automatically

- when issuing the first transfer credit award and
- when the student is changing majors.

Special Studies

Qualified students may have the opportunity to take up to **six** special studies. Those who meet the specifications described below **may take a combination of:**

- **two advanced tutorials**
- **one field work**
- **three independent studies or**
- **three honors programs.**

Petitions for these studies are available in the Program Offices, located on the second floor of Ryder Hall. Petitions should be filed at least six weeks prior to the quarter in which the special study is to be taken.

Most special studies are taken under the direction of a faculty advisor who will meet with the student at least three times during the quarter, and will be available for frequent phone conferences. The language and lab tutorials will meet weekly. Students may request a specific faculty member. However, no special study may proceed without the Program Director's approval.

Special studies are not offered in all subject areas. To find out if they are offered in your area of interest, check the course descriptions for your program in this *Bulletin*.

Before petitioning for a special study, you may wish to consult with your program office. In many cases, taking a full course will be of greater value to you.

Advanced Tutorial: The Advanced Tutorial is designed primarily for students with declared majors who have been unable to take a needed upper-level course in the usual format because **the course has not been available for two consecutive years**. The Advanced Tutorial is essentially a full course taken independently under the supervision of a faculty advisor who will provide a syllabus, test the student's progress, and ascribe a grade. With the exception of languages and a few labs, Advanced Tutorials are 3 q.h. credits each.

Students may take no more than two Advanced Tutorials and should have completed 87 q.h. before petitioning.

Field Work: Field Work courses are designed to enhance career development by allowing students to earn credit for the application of their academic studies to experiences in the workplace. Field Work courses are offered for qualified Business students and certain Liberal Arts majors. Please refer to individual course descriptions for details, including prerequisites.

A student must have a 3.0 cumulative average to be eligible for Field Work and may take only one quarter of Field Work for 6 q.h. credits. Each student shall make his or her own arrangements for doing Field Work at an approved work site, and shall spend a minimum of fifteen hours per week at the site, whether on a paid or volunteer basis.

Each student shall meet with a departmental Field Work advisor at least five times per quarter in order to plan the project, monitor the student's progress, and present and discuss a final written report. The student's grade shall be dependent upon the quality of the experience as demonstrated by reports, work products, and other documentation and upon discussions between the University College faculty advisor and the work site supervisor.

Independent Study: The Independent Study is an opportunity for degree students who have completed 96 q.h. and maintained a 3.0 q.p.a. to undertake special research, reading, or experimental study projects in areas related to their major. In addition to filing a petition, interested students should submit a study proposal for the Program Director's approval. The proposal should include a detailed outline of the objectives and plan of study, and should be accompanied by a supporting statement from the faculty member under whose direction the study will take place. *Students may take up to three Independent Studies at 3 q.h. each.* Usually these courses would count toward major elective requirements.

Honors Program: The Honors Program is similar to the Independent Study, with two exceptions: the *student must have a 3.5 q.p.a.* to be eligible, and submit a more in-depth work product to earn the additional 1 q.h. credit.

Students may take up to three Honors Courses at 4 q.h. each. Usually these courses would count toward major elective requirements.

Please Note: Students may not take more than three of either Independent Studies or Honors Programs.

Transfer Credit Policies and Procedures

Transfer Credit Policy

Students may transfer credit from accredited institutions of higher education when courses completed are applicable to the student's program in University College. The minimum course grade acceptable for transfer credit is C, or 2.0 on a four-point scale. Regardless of the source (AP, APL, CLEP, DANTES, PEP, noncollegiate instruction, coursework at other schools), the total amount of transfer credit that may be awarded may not exceed 128 quarter hours. Courses for which transfer credit has been awarded may not be repeated at University College without a reduction in the transfer credit award. An accredited institution of higher education is an institution having recognition and membership in one of the six regional accrediting associations recognized by the Council on Post-Secondary Accreditation.

Transfer Credit Procedure

Students who would like to obtain an evaluation of credits earned from another institution must file a Transfer Credit Petition with the Office of Academic and Student Affairs. The student must then write to the registrar of the institution previously attended and request that an official transcript (one bearing that institution's seal) be forwarded to the Office of Academic and Student Affairs, University College, 180 Ryder Hall, Northeastern University, 360 Huntington Avenue, Boston, MA 02115.

Upon receipt of official transcripts, the Office of Academic and Student Affairs issues an evaluation of all credits as they apply to the student's program in University College. **Students should allow at least four weeks for processing transfer credit petitions from the point when all transcripts have been received.**

Since the process of evaluating transfer credit is complex, students should not expect evaluations of their transcripts during advising appointments. Official awarding of credit is recorded on the student's University College transcript when admission to a degree program is approved. Students who wish to be admitted to a degree program may indicate this on the transfer credit petition and should attach proof of high school graduation (high school transcript, copy of diploma or GED certificate). Please see page 21 for admissions requirements.

Validation of Required Upper-Level Business Courses for Transfer Credit

It may be necessary for students entering the Bachelor of Science in Business Administration (BSBA) degree program to validate required upper-level business courses that they have taken outside the framework of the program.

The Bachelor of Science in Business Administration degree programs offered by University College conform to all standards established by the American Assembly of Collegiate Schools of Business (AACSB). AACSB has been recognized by the Council for Post-Secondary Accreditation and by the United States Office of Education as the sole accrediting organization for university bachelor's and master's degree programs in business administration.

Validation is the set of procedures that tests whether an upper-level course completed in the lower division of a bachelor's degree program should be accepted for transfer credit in the upper division of a bachelor's degree program recognized and approved by the AACSB.

In general, students are able to validate previously earned course credits by taking a sequential course, a department-approved examination, or a CLEP (College Level Examination Program) or PEP (Proficiency Examination Program) examination.

For more information on course validation, see page 77. Students should talk with a University College academic advisor for information about the validation of upper-level business courses for transfer credit.

Validation of Knowledge in Nursing

The College of Nursing endeavors to assess the clinical knowledge and skill of R.N. students in a variety of ways. In their first nursing course, students prepare a portfolio for assessment of prior learning in relation to the expected outcomes of the baccalaureate nursing program. At the conclusion of this assessment, coupled with the review of previous nursing education, qualifying students will be granted advanced placement credit of 96 quarter hours. Other avenues of advanced placement are open to the RN-BSN student consistent with regular University College transfer credit and residence policies.

Evaluation of International Educational Credentials

United States citizens and international students with Resident Alien status who have international high school or college credentials must file an International Educational Credentials Form and pay a \$45.00 evaluation fee. An evaluation for purposes of admission and/or transfer credit is issued by the Office of Academic and Student Affairs. Requirements include completion of an interview and receipt of the completed form, official copies of all transcripts and translations into English and a check or bank draft for \$45.00 payable to Northeastern University. The official assessment of international educational credentials is made in accordance with current standards for awarding transfer credit at University College or as recommended by the Center for International Higher Education Documentation.

International students with non-immigrant status must file an International Student Application (see page 17, International Students) and will have any transfer credit evaluated as part of that process.

Course(s) at Another College or University

Students already enrolled at University College who want to complete one or more courses at another institution may file a Prior Approval for Transfer Credit form to ascertain whether the course they wish to take is acceptable and equivalent to the University College course. A course description should be attached to the petition. Students may take courses elsewhere without prior approval, but do so at their own risk, as the course may not transfer into University College. There is a total limit of 128 q.h. of transfer credit from all sources. Also, the senior residency requirement stipulates that students must take their *last* 24 q.h. for an A.S. or *last* 45 q.h. for the B.A., B.S. or B.S.B.A. degree at University College. (See page 33.)

Credit by Examination

University College awards credit by examination, provided the examination does not duplicate previously earned academic credit. Credit is granted for successful completion of examinations currently available through the Advanced Placement (AP), College Level Examination Program (CLEP) and the DANTES Examination Program of the Educational Testing Service and through the Proficiency Examination Program (PEP) of the American College Testing Program. Both programs have been designed to help students obtain college-level credit for knowledge acquired through nontraditional means, such as on-the-job training, educational television, or

correspondence, extension, or independent study. The passing score for University College programs is 500 on general examinations and 50 on subject examinations. This score is established by University College and is independent of the American Council on Education recommendations. Information about these programs is available from the Office of Academic and Student Affairs at University College and from the Northeastern University Counseling Center.

Modern Language Proficiency Examination

Students may be eligible to receive a maximum of 12 q.h. of credit for proficiency in a modern language. Examinations are currently offered in French, Spanish, German, Italian, and American Sign Language. Students should contact the Liberal Arts Program office, 617-373-2416, TTY 617-373-4126, for more information or an application form.

Assessment of Prior Learning (APL)

University College students may obtain up to 18 q.h. of APL credit in specified academic disciplines for knowledge gained through prior learning experiences, whether work-related or personal.

Specifically, students may be eligible for APL credit if they have accrued a foundation of knowledge and skills equivalent to the content of courses in the following areas:

- liberal arts (ART, CMN, ECN, ENG, HST, JRN, MUS, PHL, POL, PSY, SOA, SOC, TCC, THE);
- health professions and sciences (BIO, CHM, HIA, HMG, HSC, MLS); and
- business (MIS, RE, and TRN *only*).

The primary method for documenting prior learning is through the assessment of a student portfolio, although in some instances an examination will also be required.

The student must submit an Application for Assessment of Prior Learning, along with a non-refundable \$75 application fee made payable to Northeastern University. The application fee covers assessment and processing costs and is not tied to the granting of credit. Applications are available at 180 Ryder Hall, at any satellite location, or by calling 617-373-2400 or TTY 617-373-2825. Applications should be returned to the Associate Director of Academic and Student Affairs, 180 Ryder Hall.

The application portfolio should include a written narrative, accompanied by documentation, to support the claim for prior learning credit for one or more courses. Assistance in portfolio planning is available from academic advisors in the Office of Academic and Student Affairs. Appointments for this purpose can be made by calling 617-373-2400 or TTY 617-373-2825. In order to prepare documentation, students may want to request the *Guide to Portfolio Development for the APL Program* from the Office of Academic and Student Affairs and review course syllabi available from the appropriate Program Office. Documentation may include such evidence of accomplishment as published materials, writing samples, or copies of artistic work. Whenever possible, students should link prior learning to University College courses. However, when the appropriate course is critical to the academic soundness of a program, the student may be required to take the course, but may, in addition, receive APL credit as an elective credit in the related subject area.

Applications will be forwarded to the appropriate Program Office where faculty, consultants, and program office staff will review them. Students will be notified if further documentation or an examination is necessary. Decisions on the applications will be forwarded to the Associate Director of Academic and Student Affairs. Please

allow *at least two to three months* for processing. Students will be notified in writing of the outcome. Any credit awarded will appear as transfer credit on the transcript.

Students will be permitted to enter the APL program only after all traditional sources of transfer credit have been fully utilized. Students will not receive credit for courses that normally would not transfer to University College. If a course has a CLEP, PEP, DANTES, or challenge examination available, students will be required to take the exam. Credits earned through the APL program may be applied to certificate programs as transfer credit, within the limit designated for the certificate.

Students are encouraged to apply for APL credit as early as possible in their program. All previous college credits must be transferred and a status report completed by the Office of Academic and Student Affairs before an APL application can be submitted. Portfolio evaluations take approximately *two to three months* to process, and must be completed six months prior to graduation.

Any student wishing to pursue APL credit should contact an advisor in the Office of Academic and Student Affairs, 617-373-2400 or TTY 617-373-2825, to begin the application procedure.

Credit for Extra-Institutional Learning

Extra-institutional learning is learning that takes place outside the sponsorship of legally authorized and accredited post-secondary educational institutions. The term applies to learning acquired from formal courses sponsored by associations, governments, business, and industry.

In awarding credit for extra-institutional learning, University College uses the *National Guide to Educational Credit for Training Programs* published by the American Council on Education, and *College Credit Recommendations: The Directory of the National Program on NonCollegiate Sponsored Instruction*, published by the New York Board of Regents.

Students applying for credit for extra-institutional learning must submit a Transfer Credit Petition and provide official credentials from the sponsoring non-educational organization to the Office of Academic and Student Affairs. The credit may be applied toward degree requirements at University College if recommended in the *National Guide* or the *Directory*, provided credit is not otherwise obtainable through the CLEP, PEP, or DANTES examinations (see Credit by Examination, page 27).

Grading System Policies and Procedures

Grading System

A student's work in each course is evaluated by the instructor, who awards a letter grade at the end of the quarter. This grade is officially recorded by the Registrar's Office. The grades and symbols used are given below, together with the numerical equivalents used for computing quality-point averages:

A (4.000)	C (2.000)	I Incomplete
A- (3.667)	C- (1.667)	L Audit (no credit)
B+ (3.333)	D+ (1.333)	S Satisfactory (pass/fail grade)
B (3.000)	D (1.000)	U Unsatisfactory (pass/fail grade)
B- (2.667)	D- (.667)	X Incomplete (pass/fail grade)
C+ (2.333)	F (0)	* Grade not received

Change of Grade Policy

The period for clearing any grade (including "I" grades) is restricted to one calendar year from the end of the quarter in which the course was originally taken. Thus any outstanding tests should be taken, and papers submitted at least three weeks prior to the deadline. "I" grades outstanding for twelve months or longer shall remain permanently on all records. Requests for exceptions to this policy must be made in writing to the Program Office that administers the course. Call 617-373-2400 (TTY 617-373-2825) if you are unsure whom to contact.

Grade Reports and Transcripts

All efforts are made to mail grades prior to the beginning of the following quarter. A supplementary grade report is issued when a missing grade or a grade change is received. Grade reports of degree candidates indicate both their quarterly quality-point average and their cumulative quality-point average. Problems with grades not received (*) or grade changes that have not been posted on transcripts should be addressed to the Program Office that administers the course.

Students may obtain a transcript of their grades by making a request *in writing* to the Registrar's Office, 120 Hayden Hall, Northeastern University, Boston, MA 02115. Unofficial transcripts are issued free of charge when requested in person only. Official transcripts bearing the University seal cost \$2. Call (617) 373-2302 for further information.

Incomplete ("I") Grades

The "I" grade, or incomplete, may be given only when the student fails to complete a major requirement of a course, such as a term paper or a final exam, but has been in regular attendance. Students who have missed a substantial number of class meetings without the instructor's permission receive a grade of "W." An instructor may decide that a student has done so poorly in the course that even a perfect grade in a make-up final examination could not raise the grade from "F." In this case "F" is the proper grade, regardless of the missed final examination.

All deficiencies must be made up in the manner prescribed by the instructor no later than one year following the recording of the "I" grade. Students requesting an exception to this policy must petition the Program Office that administers the course. To remove an "I" grade, the instructor must file a change of grade form with the program office. A student who elects to make up an "I" grade by taking the same course over again will be given a new grade and will be billed accordingly. The original "I" grade will remain on the student's record with a "repeat" designation.

Missed Final Examinations

Students who miss a final examination are given a grade of "I" (incomplete) unless the student has done so poorly in the course that even a perfect grade on a make-up final could not raise the grade from "F," in which case an "F" shall be given as the proper grade. Students do not automatically have the right to make up a missed final examination. Students must petition for this privilege and pay a fee of \$50 for each make-up examination. Petitions are available at each campus location or by calling 617-373-2425. Students are notified whether or not their petitions have been approved prior to the date of the make-up examination.

Students who make up a missed final examination will have the appropriate letter or pass/fail grade substituted for the "I" grade on their transcripts. Please see previous section for more information about "I" grades.

Pass/Fail Grades

Satisfactory completion of work in all courses taken on a pass/fail basis is designated on the transcript by the letter "S." Unsatisfactory work is designated on the transcript by the letter "U." Any unsatisfactory grade must be handled according to the existing policy of University College but may never be cleared by enrolling in the same course on the basis of the pass/fail system of grading.

An incomplete in a course taken on a pass/fail basis is designated by the letter "X" on the transcript and is treated according to the normal procedure for grades of incomplete.

Please see also Pass/Fail Courses on page 18.

Quality-Point Average

To obtain the quality-point average, the numerical equivalent of each grade received is multiplied by the credit hours earned, the quality points are added together, and the total quality-points are divided by the student's total quarter hours. An example follows:

Grade Achieved	Numerical Equivalent	Credit Hours	Quality Points
A	4.000	3	12.0
B-	2.667	3	8.0
C	2.000	6	12.0
F	0.000	3	0.0
		(15)	(32.0) TOTALS

The quality-point average is equal to the total quality points (in this case, 32.0) divided by the total credit hours (15), which comes to an average of 2.13.

Pass/fail grades (S, U, and X), incompletes (I), and audits (L) are not included in the quality-point average. Similarly, transfer credits are not included in quality-point averages. However, the total earned hours appearing on the student's transcript include both transfer credits and "S" grades. Transfer credits only appear if a student has been formally admitted to a degree program.

A cumulative quality-point average below 2.0 is unacceptable and does not allow a student to continue in University College or to receive a degree from Northeastern University. The "F" grade is a failure and requires repetition of the course in its entirety. University College also has a requirement that the q.p.a. in the major concentration courses must be 2.0 or better.

Repeating a Course

"F" Grades

Students who receive an "F" in a required course must repeat the course at full tuition rate. The original course and grade will remain on the record, but "repeat" will be noted next to it and the **new**, not the old, grade will be computed into the q.p.a.

Improving Q.P.A.

Students may repeat any course to improve their grade. The original course and grade will remain on the record, but "repeat" will be noted next to it. In all cases it is the **most recently received grade** which will be counted in the q.p.a., whether it is higher or lower than the original grade. There is no reduction in tuition fees for repeated courses.

Duplication of Courses

Sometimes students inadvertently repeat a course. Students will **not** receive credit twice for the same course; therefore, students are advised to be careful when selecting courses, as course titles and/or numbers sometimes change. One way for students to insure that coursework will not be duplicated, particularly if courses were taken under the old numbering system, is to petition for an updated status report.

Graduation Policies and Procedures

Residence Requirement

Every candidate for the bachelor's or associate's degree must fulfill the minimum residence requirement, which is defined as the satisfactory completion of at least forty-five quarter hours of coursework for the bachelor's degree or twenty-four quarter hours of coursework for the associate's degree, in University College **immediately preceding graduation**. At least twelve of the forty-five quarter hours, or six of the twenty-four, must be in the candidate's major field of study.

Because of this residence requirement, **students may not take courses at any other institution during their senior year for the purpose of transferring credit.**

Students whose enrollment in a degree program is interrupted for a period of one year or more will be reinstated in that program or a comparable program at the time of re-entry into University College.

At present, dual undergraduate degrees or dual majors are not available at University College. See the section on Additional Degree Status (page 22) for the residence requirement if pursuing a second degree.

Graduation Requirements

Except for certain health professions programs, the requirement for graduation from University College is 174 quarter hours for a bachelor's degree and 87 quarter hours for an associate's degree, with attainment of an overall quality-point average of 2.0 (C). Students who have transferred in a substantial amount of elective credit may have more than 174 q.h. or 87 q.h. upon completion of their programs. In addition, the student must have a 2.0 average in the required major courses. Bachelor of Science in Business Administration degree candidates must also meet all validation requirements. Although the credits allowed for acceptable work completed elsewhere by transfer students count toward fulfillment of quantitative graduation requirements, neither the credits nor the grades earned in such courses are included in the quality-point computations for graduation. Course requirements for each degree are outlined in this *Bulletin*.

Graduation with Honor

Graduation with honor is reserved for bachelor's degree candidates who have completed a minimum of 72 quarter hours of work at University College and who have demonstrated distinctly superior academic achievement as evidenced by the following quality-point averages:

Graduation with Honor	3.25 to 3.49
Graduation with High Honor	3.50 to 3.74
Graduation with Highest Honor	3.75 to 4.00

Transfer credit is not considered in determining honors.

Credit by Examination During the Senior Year

CLEP, PEP, or DANTES examinations (see page 27) may be taken by students during their final year of study provided they have met the forty-five or twenty-four quarter-hour residence requirement for graduation described above. Because of the time it takes for CLEP, PEP, and DANTES examinations to be graded and returned to the University, **students requesting June graduation must take their CLEP, PEP, or DANTES examinations no later than the winter quarter of their senior year, and students requesting September commencement must take their examinations no later than the spring term of their senior year.**

Senior Status Procedure

Each student who intends to graduate in either an Associate's or a Bachelor's Degree program during the current academic year must notify the Office of Academic and Student Affairs of his or her intention to graduate by filing for a senior status report. Commencement is held twice a year, in June and September.

Senior status reports are issued to assist students with selecting the courses they need to complete their program requirements. Seniors are encouraged to request their senior status reports during the summer prior to the academic year in which they plan to graduate. Petition forms are available at each campus location or by calling 617-373-2400 or TTY 617-373-2825. At this time, seniors are also encouraged to clear up missing grades, incompletes, transfer credit, admissions, or other problems.

Once a Senior Status Report has been completed, the Office of Academic and Student Affairs mails a Commencement Data Card, which the student *must* return by the date specified on the card to be guaranteed inclusion on the official graduation list.

Academic Audit of Seniors

The Office of Academic and Student Affairs conducts an academic audit of all seniors approximately one month prior to graduation. During this audit, academic problems such as incompletes, missing grades, missing courses, or validation problems are noted. Every effort is made to relay this information to the student through mail and telephone contact. If these problems remain unresolved, seniors are notified by certified mail that they have failed to qualify for their degree.

Commencement Ceremony

Information concerning commencement is mailed to all seniors who have returned a Commencement Data Card (see Senior Status, above) during the spring term, for June graduation, or the summer term, for September graduation.

Attendance at Commencement for all University College degree candidates is optional. Students who do not attend Commencement should receive their diplomas by mail approximately six to eight weeks after the ceremony.

Students must have cleared all academic, financial, and/or disciplinary deficiencies in order to graduate. Students who have questions about the commencement ceremony should direct them to the Commencement Office, 617-373-3639.

Overview of Academic Programs

At University College, your options are almost unlimited. Our programs of study can take you in any direction you determine toward the fulfillment of your professional or personal objectives. You may enroll as a student pursuing a degree program or as a non-degree student taking a single course or a special program.

Our programs leading to the Bachelor of Science, Bachelor of Science in Business Administration, and Bachelor of Arts degrees provide opportunities for cultural and professional development equivalent in quality and scope to those offered in the conventional four-year college enrolling full-time students. The bachelor's degree requires 174 quarter hours of credit or more.

Programs leading to the Associate in Science degree enable students to establish a knowledge base in business administration, criminal justice and security, health professions and sciences, or liberal arts. The associate's degree requires 87 quarter hours of credit and is equivalent to the conventional two-year, junior or community college program in scope and quality. University College also offers certificate programs in a wide range of disciplines.

Degree and certificate programs are offered in the following areas. (The numbers indicate the page on which detailed curricula appear.)

Business Administration

Accounting

Associate in Science 79

Bachelor of Science in

Business Administration 88

Certificate 40

Advanced Certificate 55

Banking and Financial Services

Certificate, graduate 67

Business Administration

Associate in Science 80

Certificate 41

Compensation and

Benefits Management

Certificate 42

Computer Programming and Software Development

Certificate 44

Computer Programming and Systems Analysis

Certificate 44

Computer Systems Specialist

Certificate 45

Finance

Associate in Science 81

Bachelor of Science in

Business Administration 90

Certificate 47

Human Resources Management

Associate in Science 82

Certificate, undergraduate 48

Certificate, graduate 68 

International Business and Culture

Certificate 48

Logistics and Transportation

Associate in Science 83

Management

Bachelor of Science in

Business Administration 92

ACCEL 93

Certificate 49

Management Information Systems

Associate in Science 84

Bachelor of Science in

Business Administration 94

ACCEL 95

Marketing

Associate in Science 85

Bachelor of Science in

Business Administration 96

Certificate 50

Microcomputer Software

Certificate 50

Operations Management

Associate in Science 86

Operations Technology

Bachelor of Science 98

Preparation for National Certification

APICS 58

CTL 58

NAPM 59

Purchasing and Materials Management

Associate in Science 87

APICS Examination Preparation 58

NAPM Examination Preparation 59

Real Estate

Salesperson's Examination
Preparation 59

Small Business Management and Entrepreneurship

Certificate 51

Supply Chain Management

Certificate 52



UNIX for Business

Certificate 54

Criminal Justice and Security

Computer Crime and Security

Certificate 42

Corrections

Bachelor of Science 102

Criminal Justice

Associate in Science 101

Legal Studies

Certificate 49

Policing

Bachelor of Science 103

Security

Bachelor of Science 104

Service Industry Security

Certificate, graduate 68



Health Professions and Sciences

Advanced Environmental Science

Certificate 56

Biological Science

Bachelor of Science 107

Biotechnology

Associate in Science 109

Bachelor of Science 110

Dental Hygiene

Certificate Preparation Program 63

Environmental Studies

Certificate 46

Health Information Administration

Bachelor of Science 113

Certificate, Post-Baccalaureate 114

Health Management

Bachelor of Science 115

Options 116

Continuing Care Management

Community Health Management

General Health Management

Associate in Science Transfer

Health Science

Bachelor of Science 117

Options 118

Comprehensive Health Science

Environmental Health and Safety

Associate in Science Transfer

Medical Specialty Preparation



Medical/Dental School Preparation 64

Medical Laboratory Science

Associate in Science 119

Phlebotomy Certification Preparation 59

Nursing

RN to Bachelor of Science in Nursing

(in affiliation with the College of

Nursing) 121

Paramedic Technology

Associate in Science 123

EMT/Basic Program 58

Paramedic Technology Certificate 123

Physical Therapy

Preparation Program 65

Radiologic Technology

Associate in Science 124

Part-time Associate in Science for
Radiographers 124**Speech-Language Pathology and
Audiology**

Pre-professional Preparation 65

Teacher Preparation in

Health Education 62

Liberal Arts**American Sign Language**

Certificate 40

**American Sign Language-English
Interpreting**

Advanced Certificate 57

Arts and Sciences

Associate in Science 129

Business Administration

Minor 128

Business Communication

Certificate 41

Computer Graphics

Certificate 43

Deaf Studies

Certificate 46

**Economics**

Bachelor of Arts 130

Bachelor of Science

with Certificate in Finance 130

English

Bachelor of Arts 131

Bachelor of Science 132

Fine Arts

Bachelor of Arts 133

Bachelor of Science 133

Gender and Family Studies

Certificate 47

**Graphic Design and Visual
Communication**

Associate in Science 134

Bachelor of Science 135

Computer Graphics Certificate 43

History

Bachelor of Arts 136

Bachelor of Science 137

**International Politics, Culture, and
Trade**

Bachelor of Arts 139

Liberal Arts with Business Minor

Bachelor of Science 141

ACCEL Liberal Arts with
Business Minor 142**Liberal Studies**

Bachelor of Arts 143

Paralegal Studies

Certificate 215

**Political Science**

Bachelor of Arts 145

Bachelor of Science 147

Psychology

Bachelor of Arts 149

Bachelor of Science 149

Sociology-Anthropology

Bachelor of Arts 151

Bachelor of Science 151

Human Services Elective

Concentration 152

**Teacher Preparation Programs for
Elementary, Secondary,
and Special Education 60-62****Technical Communications**

Bachelor of Science 153

Technical Writing

Certificate 53

Writing

Certificate 54

Course descriptions are listed in alphabetical order by subject area beginning on page 159.

Certificate and Special Programs

Study Options with Proven Practical Dividends

While many students attend University College to obtain an associate's or bachelor's degree, or to take specific courses, a growing number of adults have discovered the benefits of enrolling in one of University College's more than 40 certificate and special preparation programs. Each program offers a foundation of knowledge designed to provide the expertise needed for the attainment of specialized professional skills. (Please see the next page for a full listing.)

Since these popular programs were first offered in 1983, they have provided numerous benefits. Specifically, they:

- convey a cohesive base of job-related skills
- enhance career prospects within and outside the setting of one's employment
- offer marketable expertise to make career changes feasible
- prepare licensing in selected specialized areas
- present manageable learning alternatives that may be completed within one or two years
- may be applied to degree programs at any time during or after certificate studies.

Easily Converted into Career Transition Programs

If you are thinking of making a career change in the near future, you might benefit from adding one or two of the following enhancements to your certificate studies:

- CD 4100 *Managing Career Decisions* (3 q.h.) (formerly INT 4110)
- CD 4102 *Career Decision Making* (1 q.h.) (formerly INT 4114)
- CD 4104 *Career Planning/Self Marketing* (1 q.h.) (formerly INT 4112)
- Free job search seminars offered by the Department of Career Services (call 617-373-2430 for times and places). Other Career Development courses can be found on pages 174-175.

For example, you might take CD 4100, CD 4102, or CD 4104 as a first step to determine which career options are "right" for you. The Department of Career Services will offer a wide variety of job search seminars geared to assess your strengths, offer resume and interview strategies, and keep you updated on the changing marketplace (see pages 9-11). Combined with a certificate program, these modest initiatives can take you a long way on the road to realizing your career dreams.

How to Proceed

Students entering a certificate program should file a certificate petition with the Office of Academic and Student Affairs. When you have completed all coursework toward your certificate, you should file a Certificate Completion Form. Petitions are available from the Office of Academic and Student Affairs, 180 Ryder Hall, 617-373-2400 or TTY 617-373-2825, and at all campus locations.

For assistance in determining course prerequisites or in deciding on the appropriate program, call 617-373-2400 or TTY 617-373-2825 for an appointment with an academic advisor, or call the number listed for each individual certificate program.

Most certificate programs are designed to facilitate transfer into a related degree program. In addition, a limited amount of transfer credit for introductory courses taken at another school may be applied toward certificate program requirements. The number of transfer credits permitted varies by certificate but is usually limited to 9 quarter hours, or approximately one-third of certificate course requirements. Similarly, a limited number of course substitutions may be requested. (See page 23 for details.)

Students who choose to complete a second certificate in a subject related to the first may find that the two have certain courses in common. However, a second certificate will not be awarded if more than 50 percent of the coursework is duplicated.

Beginning with courses taken Fall term 1987, students must achieve a grade of C (2.0) or better in each course in order to receive a certificate.

Undergraduate Certificate Programs

- Accounting
- American Sign Language
- Business Administration
- Business Communication
- Compensation and Benefits Management
- Computer Crime and Security
- Computer Graphics
- Computer Programming and Software Development
- Computer Programming and Systems Analysis
- Computer Systems Specialist*
- Deaf Studies
- Environmental Studies
- Finance
- Gender and Family Studies
- Human Resources Management
- International Business and Culture
- Legal Studies
- Management
- Marketing
- Microcomputer Software
- Paramedic Technology*
- Small Business Management and Entrepreneurship
- Supply Chain Management
- Technical Writing
- UNIX for Business
- Writing

Advanced Undergraduate Certificate Programs

- Advanced Accounting
- Advanced Environmental Science
- ASL-English Interpreting
- Health Information Administration-Post-Baccalaureate
- Paralegal Studies*

Certification Preparation Programs

- APICS (Preparation for National Certification)
- CTL (Preparation for National Certification)
- EMT/BASIC
- NAPM (Preparation for National Certification)
- Phlebotomy Certification Preparation
- Real Estate Salesperson's Exam Preparation
- Teacher Preparation Programs for Elementary, Secondary, and Special Education
- Teacher Preparation in Health Education

Graduate School Preparation Programs

- Dental Hygiene Preparation
- Medical/Dental School Preparation
- Physical Therapy Preparation
- Speech-Language Pathology and Audiology Pre-professional Preparation

Graduate Certificate Programs

- Banking and Financial Services*
- Human Resources Management*
- Service Industry Security*

**Special application procedures necessary.*

Undergraduate Certificate Programs

Accounting Certificate Program



Designed to enable students to gain a foundation of knowledge in the accounting field, this program teaches how to compile, analyze, and prepare critical business and financial records.

				quarter hours
ACC 4101	ACC 4102	ACC 4103	Accounting Principles 1, 2, 3	9
ACC 4301	ACC 4302	ACC 4307	Intermediate Accounting 1, 2, 3	9
ACC 4310			Cost Accounting 1	3
FI 4301			Principles of Finance	3

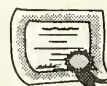
Total Quarter Hours (Possible transfer credit: 9 quarter hours)

24

For more information, call 617-373-2418 or 617-373-2419.

The courses required for the Accounting Certificate are scheduled at all campuses.

Advanced Accounting Certificate Program



See page 55 for details.

Advanced Environmental Science Certificate Program



See page 56 for details.

American Sign Language Certificate Program



Developed to introduce signing and give students the chance to practice and gain confidence in communicating with Deaf people. (See also the Deaf Studies Certificate, page 46; for a more advanced program, please see ASL-English Interpreting Certificate, page 57.)

			quarter hours
ASL 4101	ASL 4102	American Sign Language 1*, 2*	8
ASL 4201	ASL 4202	Intermediate American Sign Language 1*, 2	8
ASL 4301	ASL 4302	Advanced American Sign Language Proficiency 1, 2	8

Total Quarter Hours (Possible transfer credit for ASL 4101, ASL 4102, ASL 4201 12 quarter hours; all other credits must be completed in residence; a 3.0 cumulative grade-point average is required to receive this certificate.)

24

*A language proficiency examination is available for these courses; the credits will show as transfer credit. For more information call 617-373-3064 (voice only) or 617-373-3067 (TTY only).

The courses required for the American Sign Language Certificate are scheduled at the Boston campus.

ASL-English Interpreting Certificate

See page 57 for details.



Business Administration Certificate Program



Intended to help students get started or catch up on the basics of business, this program is often taken as a foundation for further study of the various facets of business administration.

			quarter hours
ACC 4101	ACC 4102	Accounting Principles 1, 2	6
HRM 4301	HRM 4302	Organizational Behavior 1, 2	6
MKT 4301		Introduction to Marketing 1	3
MGT 4101	MGT 4102	Introduction to Business and Management 1, 2	6
MGT 4358		Today's Management Issues	3

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **24**

For more information, call 617-373-2418 or 617-373-2419.

The courses required for the Business Administration Certificate are scheduled at all campuses.

Business Communication Certificate Program



Built on the premise that effective communication in a variety of business situations is a key factor in career satisfaction and advancement, this vital program sharpens verbal and writing skills for today's business world.

		quarter hours
CMN 4102	Group Discussion	3
CMN 4152	Conducting Interviews in the Professions	3
CMN 4153	Techniques of Persuasion	3
CMN 4154	Negotiation Skills	3
CMN 4251	Business and Professional Speaking	3
HRM 4301	Organizational Behavior 1	3
JRN 4335	Public Relations Basics	3
MGT 4101	Introduction to Business and Management 1	3

Choose one writing course from the following:

ENG 4380	Writing for the Professions 1	(3)
JRN 4112	Writing for Media 1	(3)
TCC 4101	Technical Writing 1	(3)

or choose any acceptable substitute in written communication, with prior approval of the department consultant or program director.

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **27**

For more information, call 617-373-2416 or 617-373-2423.

The courses required for the Business Communication Certificate are scheduled at the Boston, Burlington, Downtown, Framingham, and Weymouth campuses.

Compensation and Benefits Management Certificate Program



Created to offer students the opportunity to learn about the increasingly important and complex role of benefits management, this program focuses on today's business organizations.

		quarter hours
HRM 4309	Labor Relations	3
HRM 4310	Human Resources Management*	3
HRM 4321	Wage and Salary Administration *	3
HRM 4322	Employee Benefits*	3
HRM 4333	Employment Rights*	3
HRM 4334	Human Resource Information Systems	3
HRM 4348	The Changing Work Force*	3
Human Resources Management (HRM) course of your choice		3
Total Quarter Hours (Possible transfer credit: 9 quarter hours)		24

For more information, call 617-373-2418 or 617-373-2419.

*This certificate may be taken by students who have also completed the Human Resources Management Certificate. Asterisked courses do not have to be repeated.

The courses required for the Compensation and Benefits Management Certificate are scheduled at the Boston, Burlington, and Weymouth campuses.

Computer Crime and Security Certificate Program



Introduces students to information security principles, recognizing and preventing computer crime, and investigating and reconciling computer crime incidents. Students will learn how information technology security programs are developed and how to coordinate these programs with auditors, legal departments, law enforcement officials, and other agencies. Courses cover hardware security, information security, contingency planning, technology crime prevention and detection, and legal issues pertaining to this emerging industry.

			quarter hours
CJ 4114	CJ 4115	Introduction to Law 1 and 2	6
CJ 4201		Criminal Investigation 1	3
CJ 4403		Introduction to Security	3
CJ 4412		Computer Crime and Security	3
CJ 4420		Advanced Computer Application in Criminal Justice	3
MIS 4114		Introduction to PC Software*	3
MIS 4360		Computer Privacy and Security	3
Total Quarter Hours (Possible transfer credit: 9 quarter hours)			24

For more information, call 617-373-2423.

*Should be taken at the beginning of the student's course of study.

The courses required for the Computer Crime and Security Certificate are scheduled at the Boston campus.

Computer Graphics Certificate Program



Designed to offer students a comprehensive background in graphic design through the core curriculum, the program allows students to elect *ART 4186 Computer Graphic Design Portfolio* if they are interested in electronic graphic design careers or *ART 4184 Presentation Graphics* if they are interested in the production side of the industry. This elective course must be taken last as the capstone to the program.

		quarter hours
ART 4135	Design Fundamentals*	3
ART 4139	Color Theory and Practice*	3
ART 4140	Graphic Communication and Production	3
ART 4141	Graphic Design 1*	3
ART 4151	Typography	3
ART 4181	Introduction to Computer Graphics*	3
ART 4183	Electronic Publishing Systems*	3
ART 4185	Creative Imaging: Custom Computer Design*	3
ART 4187	Advanced Computer Illustration*	3
ART 4189	Advanced Electronic Publishing Design*	3
ART 4366	Promotional and Technical Publications: Design and Production*	3
ART 4184	Presentation Graphics*	(3)
or	or	
ART 4186	Computer Graphic Design Portfolio*	(3)

Total Quarter Hours (Possible APL or transfer credit: 9 quarter hours) **36**

For more information, call 617-373-2416 or 617-373-2423.

*3 1/2-hour studio.

The courses required for the Computer Graphics Certificate are scheduled at the Boston campus.

Desktop Publishing

Students who wish to take an introductory desktop publishing course and who do not plan to take a full certificate program should consider the following courses:

ART 4180 Macintosh Desktop Publishing
MIS 4347 Desktop Publishing for the PC (DOS platform).

Computer Programming and Software Development Certificate Program



Designed to allow as much flexibility as possible, we leave the selection of courses for this MIS certificate up to you.

Choose five courses from among the following:

	quarter hours
MIS 4236	Advanced PC Software (3)
MIS 4273	PC DOS (3)
or	or
MIS 4282	Operating Systems Overview (3)
MIS 4283	Introduction to Windows Programming (3)
MIS 4210	Business Programming Logic (3)
MIS 4321	UNIX I (3)
MIS 4342	Advanced Database (3)
MIS 4360	Computer Privacy and Security (3)

Choose three courses from among the following:

MIS 4221	COBOL Programming 1 (3)
MIS 4222	COBOL Programming 2 (3)
MIS 4235	Advanced COBOL Programming (3)
MIS 4241	Programming in BASIC 1 (3)
MIS 4242	Programming in BASIC 2 (3)
MIS 4276	C Programming 1 (3)
MIS 4277	C Programming 2 (3)
MIS 4278	C++ for C Programmers (3)
MIS 4322	UNIX II (3)
MIS 4346	SQL: Introduction to Structured Query Language (3)

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **24**

For more information, call 617-373-2418 or 617-373-2419.

The courses required for the Computer Programming and Software Development Certificate are scheduled at the Boston, Burlington, and Downtown campuses.

Computer Programming and Systems Analysis Certificate Program



Built to help students keep up with new developments in this fast-paced field, this program enhances career prospects by providing a concrete knowledge-base in programming.

	quarter hours
MIS 4114	Introduction to PC Software 3
MIS 4115	Introduction to Computers and Information Systems 3
MIS 4221 MIS 4222	COBOL Programming 1, 2 (optional) (6)
MIS 4236	Advanced PC Software 3
MIS 4276 MIS 4277	C Programming 1, 2 6
MIS 4278	C++ for C Programmers 3
MIS 4283	Introduction to Windows Programming 3
MIS 4301	Structured Systems Analysis and Design 1 3
MIS 4302	Structured Systems Analysis and Design 2 3

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **27-33**

This certificate differs from the Computer Systems Specialist Program (described next) in that the courses for this certificate are regularly offered at the Boston, Burlington, Dedham, and Downtown campuses and may be completed over a longer period of time than in the Specialist Program. For more information about both programs, call 617-373-2418 or 617-373-2419.

Computer Systems Specialist Program



The Program

Designed to offer training to become computer systems specialists, this program is intended for students who are interested in entry-level programming positions in business and industry. The program addresses the career goals of individuals who have little or no academic or work-related background in computer programming. Students who successfully complete the program receive a Computer Systems Specialist Certificate.

Admission

Computer Systems Specialist Program candidates will be evaluated for acceptance into the program on the basis of their transcripts from high school or most recently attended college, their motivation and their expressed goals. Enrollment is limited. This program is offered only if a sufficient number of qualified candidates apply.

Time and Place

The program is scheduled to begin twice during the academic year, once in the fall and again in the spring quarter. Classes are scheduled for thirty-one weekends: at the Burlington Campus, Friday, 6 p.m. to 10 p.m., and all day Saturday, 9 a.m. to 5:30 p.m. and at the Downtown Boston Campus on Thursday and Saturday at the same hours.

Academic Credit and Certification

Upon satisfactory completion of the program, students will have accumulated forty-five quarter hours of academic credit, and will receive the program certificate. The credits represent 26 percent of the credits necessary for a bachelor's degree.

Placement Assistance

Although job placement is not guaranteed, most students who successfully complete the program find suitable employment. Placement services include individual counseling; job-search seminars on career opportunities, self-assessment, resume preparation, and interviewing skills; and resume referrals to employers.

For More Information

For more information about the program and an application form, contact the Business Administration Program Office, Northeastern University, University College, 360 Huntington Avenue, Boston, Massachusetts 02115, 617-373-2418 or 617-373-2419.

Courses in the program are:

		quarter hours
MIS 4116	Introduction to PC Software and Information Systems Intensive	6
MIS 4210	Business Programming Logic	3
MIS 4236	Advanced PC Software	3
MIS 4243	Visual Basic Programming	3
MIS 4278	C++ for C Programmers	3
MIS 4279	C Programming 1, 2 Intensive	6
MIS 4282	Operating Systems Overview	3
MIS 4283	Introduction to Windows Programming	3
MIS 4305	Structured Systems Analysis and Design Intensive	6
MIS 4307	Communications and Networking	3
MIS 4321	UNIX 1	3
MIS 4345*	Database Management Systems	3

Total Quarter Hours

45

*For course description see MIS 4445.

The Computer Systems Specialist Program is offered at the Downtown and Burlington campuses.

Deaf Studies Certificate Program



Deaf studies provides the opportunity to solidify and enhance the student's ASL skills and knowledge of the Deaf Community. It also provides additional educational opportunities for those who plan to enter the field of interpreting and those who have other goals related to deafness.

		quarter hours
ENG 4501	Linguistics	3
ASL 4410	Linguistics of American Sign Language	3
ASL 4412	American Deaf Culture	3
ASL 4411	Deaf History	(3)
or	or	
ASL 4413	ASL Literature	(3)
ASL 4415	Deaf Community Practicum	3
ASL 4600	Introduction to Interpreting	3

Total Quarter Hours

18

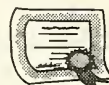
For more information, call 617-373-2416 or 617-373-2423.

Courses must be completed in residence; a 3.0 cumulative grade-point average is required to receive this certificate.

The courses for the Deaf Studies Certificate are scheduled at the Boston campus.

See also the American Sign Language Certificate, page 40; for a more advanced program, see ASL-English Interpreting Certificate, page 57.

Environmental Studies* Certificate Program



Developed for those concerned with the environment and those whose jobs deal directly with environmental issues, such as lawyers, journalists, and public relations professionals, this program addresses contemporary concerns. An extensive science background is *not* required.

		quarter hours
ESC 4103	Introduction to the Earth Sciences:	
	The Solid Earth	(3)
or	or	
ESC 4111	Geology of the Boston Area	(3)
ESC 4220	Wetlands	3
ESC 4250	Conservation and the Nation	3
ESC 4251	Conservation and the Community	3
ESC 4252	Conservation Management	3
BIO 4224 BIO 4225 BIO 4226	Ecology 1, 2, 3	9

Total Quarter Hours

24

For more information, call the Health Professions and Science Program at 617-373-5796.

*See Advanced Environmental Science Certificate Program on page 56.

The courses for the Environmental Studies Certificate are scheduled at the Boston campus.

Finance Certificate Program



Intended to help students get the skills they need to assume more responsibility on the job, this program can help get you started on a finance career in banks, corporations, brokerage firms, schools, and government and social agencies, as well as help you advance to a management position.

				quarter hours
ACC 4101	ACC 4102	ACC 4103	Accounting Principles 1, 2, 3	9
FI 4301			Principles of Finance	3
FI 4302			Financial Management	3
FI 4310			Investment Principles	3
FI 4320			Credit Principles	3
FI 4325			Budgeting and Planning	3

Total Quarter Hours (Possible transfer credit: 9 quarter hours) 24

For more information, call 617-373-2418 or 617-373-2419.

The courses required for the Finance Certificate are scheduled at the Boston, Burlington, Dedham or Westwood, Downtown, Framingham, Marshfield, Milford and Weymouth campuses.

Gender and Family Studies Certificate Program



Designed for community and human services professionals and those who wish to understand the dynamics of the modern family and workplace, this certificate combines courses in communication studies and sociology.

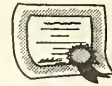
		quarter hours
CMN 4101	Fundamentals of Human Communication	3
SOC 4100	Roles, Culture, and the Individual	3
<i>Choose six of the following:</i>		
CMN 4231	Gender Communication	(3)
CMN 4225	Family Communication	(3)
SOA 4160	Gender Roles and the Family	(3)
SOC 4154	Sex and Gender Roles in Society	(3)
SOC 4155	Family Relations	(3)
SOC 4156	Violence in the Family	(3)
SOC 4177	Gender in the Workplace	(3)

Total Quarter Hours (Possible transfer credit: 9 quarter hours) 24

For more information, call 617-373-2416 or 617-373-2423.

The courses required for the Gender and Family Studies Certificate are scheduled at the Boston and Burlington campuses.

Human Resources Management Certificate Program



Developed to enhance skills to handle the changing aspects of employer/employee relations, this certificate program addresses the rapidly changing and increasingly complex workplace.

		quarter hours
HRM 4301	HRM 4302	Organizational Behavior 1, 2
HRM 4310		Human Resources Management*
HRM 4321		Wage and Salary Administration*
HRM 4322		Employment Benefits*
HRM 4325		Training and Development
HRM 4333		Employment Rights*
HRM 4348		The Changing Work Force*

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **24**

For more information, call 617-373-2418 or 617-373-2419.

*This certificate may be taken by students who have also completed the Compensation and Benefits Management Certificate program. Asterisked courses do not have to be repeated.

The courses required for the Human Resources Management Certificate are scheduled at the Boston, Burlington, Dedham or Westwood, Downtown, Framingham, Milford, and Weymouth campuses.

International Business and Culture Certificate Program



Created to blend analytic business skills with the practical insights needed to compete globally and take advantage of growing opportunities in the international marketplace, this certificate program can help American managers and professionals develop a new understanding of how business is conducted on a multi-cultural level.

		quarter hours
BL 4316	International Law	3
HRM 4347	Managing People in International Settings	3
LNJ 4225	Japanese Culture	(3)
and/or	and/or	
LNR 4225	Russian Culture and Society	(3)
and/or	and/or	
LNF 4225	Culture of the European Economic Community	(3)
MGT 4348	The Global Marketplace	3
MGT 4357	Cultural Issues in International Business	3

Foreign Language: Choice of 1) Spanish, 2) French, 3) Japanese, 4) German, or 5) Russian* **8**

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **23 to 29**

*Students may be eligible to receive a maximum of 8 q.h. of credit for proficiency in a modern language. Language Exam Credit is considered for transfer credit. Examinations are currently offered in French, Spanish, Russian, and German. Students should contact the Liberal Arts Program Office, 617-373-2416 or 617-373-2423, for more information or an application form.

The courses required for the International Business and Culture Certificate are scheduled at the Boston campus.

Legal Studies Certificate Program



Designed to give a background in the evolution and concepts of criminal law, this certificate program examines the fundamentals of trial procedures, the rules of evidence, and the history and development of the American Constitution.

			quarter hours
CJ 4101		Administration of Criminal Justice	3
CJ 4108	CJ 4109	Criminal Law and Procedure 1, 2	6
CJ 4110		Constitutional Law	3
CJ 4114	CJ 4115	Introduction to Law 1, 2	6
CJ 4118		Juvenile Law	3
CJ 4511		Survey of Criminal Evidence	3

Total Quarter Hours (Possible transfer credit: 6 quarter hours) **24**

For more information, call 617-373-2423.

The courses required for the Legal Studies Certificate are scheduled at the Boston campus.

Management Certificate Program



Developed to offer students the opportunity to earn skills in all areas of management, this program can be the key to career advancement in today's business world.

			quarter hours
HRM 4301		Organizational Behavior 1	3
MGT 4101	MGT 4102	Introduction to Business and Management 1, 2	6
MGT 4103		Introduction to Business and Management 3	3
MGT 4320		Managing Change	3
MGT 4329		Managing Small Businesses	3
MGT 4358		Today's Management Issues	3
MIS 4114		Introduction to PC Software	3
MIS 4115		Introduction to Computers and Information Systems	3

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **27**

For more information, call 617-373-2418 or 617-373-2419.

The courses required for the Management Certificate are scheduled at the Boston, Burlington, Dedham or Westwood, Downtown, Framingham, and Weymouth campuses.

Marketing Certificate Program



Created to help prepare students for a marketing career, this program reveals how to identify consumer needs, develop new products or services, determine prices, deal with customers, and design promotional strategies.

			quarter hours
HRM 4301	HRM 4302	Organizational Behavior 1, 2	6
MKT 4301		Introduction to Marketing 1	3
MKT 4302		Introduction to Marketing 2	3
MKT 4308		Direct Response Marketing	3
MKT 4310		Advertising Management 1	3
MKT 4315		Professional Selling Skills	3
MKT 4320		Marketing Management	3

Total Quarter Hours (Possible transfer credit: 9 quarter hours)

24

For more information, call 617-373-2418 or 617-373-2419.

The courses required for the Marketing Certificate are scheduled at Boston, Burlington, Dedham or Westwood, Downtown, Framingham, Milford, and Weymouth campuses.

Microcomputer Software Certificate Program



Designed for managers, administrators, and office support staff needing a comprehensive knowledge of microcomputer software either to foster promotion within their present organization or seek employment elsewhere.

			quarter hours
MIS 4114		Introduction to PC Software	3
MIS 4115		Introduction to Computers and Information Systems	3
MIS 4236		Advanced PC Software	3
MIS 4276		C Programming 1	3
MIS 4277		C Programming 2	3
MIS 4282		Operating Systems Overview	(3)
or		or	
MIS 4273		PC DOS	(3)
MIS 4307		Communications and Networking	3
MIS 4342		Advanced Database	3
MIS 4347		Desktop Publishing for the PC	3

Total Quarter Hours (Possible transfer credit: 9 quarter hours)

27

For more information, call 617-373-2418 or 617-373-2419.

The courses required for the Microcomputer Software Certificate are scheduled at the Boston, Burlington, Dedham, and Downtown campuses.

Paramedic Technology Certificate Program



See page 123 for details.

Small Business Management and Entrepreneurship Certificate Program



Developed as a thorough overview of small business operations, this program focuses on generating a business idea, drawing up a comprehensive business plan, hiring employees, and keeping sound financial records.

		quarter hours
ACC 4101	Accounting Principles 1	3
FI 4301	Principles of Finance	3
FI 4307	Small Business Finance	3
MGT 4317	The Business of Consulting	3
MGT 4328	Creating New Ventures	3
MGT 4329	Managing Small Businesses	3
MGT 4340 MGT 4341	Small Business 1, 2	6

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **24**

For more information, call 617-373-2418 or 617-373-2419.

The courses required for the Small Business Management Certificate are scheduled at the Boston, Burlington, and Downtown campuses.

Supply Chain Management Certificate Program



The Supply Chain is the network of suppliers, warehouses, distribution centers and retailers through which materials are acquired and transformed into products and delivered to the customer. Supply Chain Management involves the selection of suppliers, transportation routes, manufacturing facilities, production levels, and tactical plans and schedules that enable companies to optimize performance levels.

The Supply Chain Management Certificate allows students to focus on one of three tracks: Operations Management, Logistics and Transportation, and Purchasing and Materials Management. Academic work covers introductory management and organizational behavior tools in the three tracks and topics on planning and control, distribution management, and production scheduling in individual tracks.

On completing a Supply Chain Management Certificate, students may elect to pursue an associate's degree in Operations Management, Logistics and Transportation, or Purchasing and Materials Management or a bachelor's degree in marketing, finance, or another functional area. Choosing the operations track in the certificate also allows students to pursue the Operations Technology Bachelor of Science degree.

		quarter hours
HRM 4301	Organizational Behavior 1	3
MGT 4101	Introduction to Business and Management 1	3
OM 4301	Introduction to Operations Management	3
OM 4351 (formerly PUR 4351)	Introduction to Purchasing	3
TRN 4302	Introduction to Logistics	3

Choose one of the following three tracks:

I. Operations Management Track

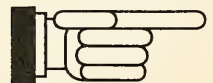
Take the following three courses:

OM 4314	Productivity Enhancement and Quality	3
OM 4321	Operations Planning and Control	3
OM 4396 (formerly PUR 4396)	Systems and Technologies	3

II. Logistics/Transportation Track

Choose 9 q.h. from the following:

TRN 4301	Elements of Transportation	(3)
TRN 4304	Advanced Logistics	(3)
TRN 4305	Traffic Management	(3)
TRN 4316	Carrier Management	(3)
TRN 4325	Management of Warehouse Operations	(3)
TRN 4342	Transportation Loss, Damage, and Other Claims	(3)
TRN 4350	International Transportation and Distribution Management	(3)



III. Purchasing and Materials Management Track

Choose 9 q.h. from the following:

OM 4321	Operations Planning and Control	(3)
OM 4357 (formerly PUR 4357)	Business Negotiations	(3)
OM 4358 (formerly PUR 4358)	Materials Requirements Planning	(3)
OM 4370 (formerly PUR 4370)	Inventory Management	(3)
OM 4390 (formerly PUR 4390)	Just-In-Time Manufacturing	(3)
OM 4395 (formerly PUR 4395)	Master Production Scheduling	(3)
OM 4396 (formerly PUR 4396)	Systems and Technologies	(3)

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **24**

For more information, call 617-373-2419 or 617-373-2418.

The courses required for the Supply Chain Management Certificate are scheduled at the Boston and Burlington campuses.

Technical Writing Certificate Program



Designed to help students acquire writing skills for a career in a technical field, this program can also sharpen skills for a variety of writing professions.

	quarter hours
ART 4140	Graphic Communication and Production 3
MIS 4114	Introduction to PC Software 3
MIS 4115	Introduction to Computers and Information Systems 3
TCC 4101 TCC 4102	Technical Writing 1, 2 6
TCC 4105	Editing for Science and Technology 3
TCC 4301 TCC 4302	Computer Software Technical Writing 1, 2 6

Choose one computer language:

MIS 4221	COBOL Programming 1	(3)
or	or	
MIS 4241	Programming in BASIC 1	(3)
or	or	
MIS 4276	C Programming 1	(3)

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **27**

For more information, call 617-373-2416 or 617-373-2423.

The courses required for the Technical Writing Certificate are scheduled at the Boston, Burlington, and Downtown campuses.

UNIX for Business Certificate Program



Designed to enable students to develop a working knowledge of UNIX principles and proficiency in "C" programming, this program places students on the cutting edge of technology.

			quarter hours
MIS 4282		Operating Systems Overview	3
MIS 4321	MIS 4322	UNIX 1, 2	6
MIS 4276	MIS 4277	C Programming 1, 2	6
MIS 4278		C++ for C Programmers	3
MIS 4301	MIS 4302	Structured Systems Analysis and Design 1, 2	6
MIS 4307		Communications and Networking	3

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **27**

For more information, call 617-373-2418 or 617-373-2419.

The courses required for the UNIX for Business Certificate are scheduled at the Boston and Burlington campuses.

Writing Certificate Program



Created to allow students to investigate and practice different types of writing, this program can help develop the organizational and communication skills necessary for a variety of careers.

			quarter hours
ENG 4349	ENG 4350	Expository and Persuasive Writing 1, 2	6
ENG 4352		Expository Communications	3
ENG 4356		Creative Writing	3
ENG 4363		Writing for the Marketplace	3
JRN 4112	JRN 4113	Writing for Media 1, 2	6
JRN 4522		Magazine Writing	3
TCC 4101		Technical Writing 1	3

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **27**

For more information, call 617-373-2416 or 617-373-2423.

The courses required for the Writing Certificate are scheduled at the Boston and Burlington campuses.

Advanced Undergraduate Certificate Programs

University College offers several certificate programs designed to meet the needs of students who have already completed a substantial body of college work. These programs all have specific prerequisites for entry, and students should read the descriptive information provided to determine whether they are eligible.

Students wishing to enter one of these programs should file a petition with the Office of Academic and Student Affairs. **If documentation of transfer credit is important for establishing that prerequisites have been met, copies of college transcripts should be attached to the petition.** Petitions are available from the Office of Academic and Student Affairs, 180 Ryder Hall, 617-373-2400 or TTY 617-373-2825, and at all campus locations.

All certificate policies stated on pages 38-39 apply to Advanced Certificate Programs as well.

Advanced Accounting Certificate Program



Created for advanced students who have earned degrees already or who are majoring in areas other than accounting, this program can provide a second dimension or specialization in accounting for the management, finance, marketing or management information systems professionals.

This program is open only to students who have completed at least 80 quarter hours of college-level work. If you are new to University College, please attach proof that you have earned 80 q.h. to your "entering certificate petition." Students must meet the prerequisites for each course as outlined in the individual course descriptions. Students enrolled in the University College BSBA Accounting degree are *not* eligible to receive this certificate.

				quarter hours
ACC 4301	ACC 4302	ACC 4307	Intermediate Accounting 1, 2, 3	9
ACC 4408			Intermediate Accounting 4	3
ACC 4310			Cost Accounting 1	3
ACC 4411			Cost Accounting 2	3
ACC 4425	ACC 4426		Auditing 1, 2	6
ACC 4440	ACC 4441		Federal Income Taxes 1, 2	6
ACC 4400			Accounting Information Systems	3

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **33**

For more information, call 617-373-2418 or 617-373-2419.

The courses required for the Advanced Accounting Certificate are scheduled at the Boston, Burlington, and Downtown campuses.

Advanced Environmental Science Certificate Program



Intended for upper-level science and engineering students who wish to enter the environmental field, this advanced certificate program is also appropriate as a post-baccalaureate certificate for professionals already working in science and/or engineering. Interested students should have a knowledge of calculus, physics and chemistry.

Choose a minimum of 24 quarter hours of coursework from the following courses.

		quarter hours
CET 4350	Environmental Engineering 1*	4
ESC 4111	Geology of the Boston Area	3
ESC 4218	Groundwater	3
ESC 4219	Geochemistry of Groundwater	3
ESC 4220	Wetlands	3
ESC 4221	Environmental Geophysics	3
ESC 4430	Soils and the Environment	3
ESC 4435	Air Quality	3
ESC 4450	Introduction to Hydrology	3
ESC 4681	Science, Technology and Modern Societies	3
MET 4370	Fluid Mechanics A*	4
MGT 4354	The Manager's Role in Environment Issues	3

Total Quarter Hours

24

*These courses are offered through the Lowell Institute School at Northeastern University, a division of the School of Engineering Technology.

For more information, call the Health Professions and Science Program at 617-373-5796.

The courses required for the Advanced Environmental Science Certificate are scheduled at the Boston campus.

American Sign Language-English Interpreting Certificate Program



ADVANCED CERTIFICATES

The Program

Designed to offer students education and training as sign language interpreters, the American Sign Language-English Interpreting Certificate Program was developed for students already proficient in American Sign Language and English and familiar with Deaf culture. The ten courses in the program cover the theory and practice of interpreting. Students who are looking for entry-level staff positions or freelance assignments may find this program helpful. Students preparing for state quality assurance screening and national evaluation may also benefit from this program.

To obtain the certificate, students must complete all required coursework with grades of B or better in each class.

Admission

Candidates for admission must complete the American Sign Language and Deaf Studies certificates and a screening procedure before entering the program. The screening will assess abilities in ASL and spoken English, knowledge of American Deaf culture and American mainstream culture, memory, and cognitive processing.

For More Information

For the introductory programs (ASL and Deaf Studies Certificates), please see pages 40 and 46. Applications and further information are available from the ASL Director, 276 Holmes Hall, Northeastern University, Boston, MA 02115, 617-373-3064 (voice only) or 617-373-3067 (TTY only).

				quarter hours
ASL 4601	ASL 4602	ASL 4603	American Sign Language-English Interpreting 1, 2, 3	12
ASL 4607			Interpreting Lab	4
ASL 4608			Practicum*	8
ASL 4609			Contrastive Analysis for Interpreters	4
ASL 4610			Interpreters at Work	3
ASL 4612			Interpreter Role and Ethics	4
Elective				3
Suggested: CMN 4111; CMN 4151; CMN 4154; CMN 4221; CMN 4231; PHL 4165; PHL 4235; SOA 4155; SOC 4100; SOC 4154; SOC 4170; SOC 4177; SOC 4178; SOC 4205; SOC 4240; THE 4120.				

Recommended: (not counted toward certificate)

ASL 4604	Special Topics in Interpreting	(3)
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Total Quarter Hours (Possible transfer credit: 12 quarter hours) **38**

The courses required for the American Sign Language-English Interpreting Certificate are scheduled at the Boston campus.

*Must be taken twice.

Health Information Administration Post-Baccalaureate Certificate Program



See page 114 for details.

Paralegal Studies Certificate Program



See page 215 for details. Refer to INT 4400.

Certification Preparation Programs

APICS—Preparation for National Certification

The following courses are preparation for national exam certification leading to the title, Certified Production and Inventory Control Manager (CPIM).

		quarter hours
OM 4321	Operations Planning and Control	3
OM 4358 (formerly PUR 4358)	Materials Requirements Planning	3
OM 4370 (formerly PUR 4370)	Inventory Management	3
OM 4390 (formerly PUR 4390)	Just-In-Time Manufacturing	3
OM 4395 (formerly PUR 4395)	Master Production Scheduling	3
OM 4396 (formerly PUR 4396)	Systems and Technologies	3

Total Quarter Hours (Possible transfer credit: 9 quarter hours) **18**

Please call 617-373-2418 or 617-373-2419 for information concerning the APICS certification examination.

CTL—Preparation for National Certification (Certified in Transportation and Logistics)

The American Society of Transportation and Logistics, Inc. has agreed to waive certain portions of their qualifying examination for the CTL through the successful completion of appropriate University College courses. Call 617-373-2418 or 617-373-2419 for further information.

Emergency Medical Technician / Basic



This course is designed for those who wish to become certified EMTs as well as for those who just want to be prepared for emergencies. Students who successfully complete the course receive nine quarter hours of credit, a Northeastern University certificate, and a CPR Healthcare Provider card from the American Heart Association. They also become eligible to take the state EMT licensing examination.

The EMT/Basic course is offered at the Boston, Burlington, and Dedham campuses. Students spend 6 hours in class weekly for 12 weeks, attend 4 all-day Saturday exercises, and participate in 10 hours of in-hospital emergency room observation. There is a special tuition rate.

		quarter hours
EMS 4107	EMT/Basic	9
Total Quarter Hours		9

For more information, call 617-238-8400.

For information on our Paramedic Technology Program, see page 123.

NAPM—Preparation for National Certification

The following course prepares students to take the NAPM certification exams leading to Certified Purchasing Manager (C.P.M.). This course may be applied toward the Supply Chain Management Certificate and/or the associate's degree in Purchasing.

		quarter hours
OM 4351 (formerly PUR 4351)	Introduction to Purchasing	3

For more information, call 617-373-2418 or 617-373-2419.

Phlebotomy Certification Preparation

This program is geared toward students who want to enter the health field as well as to currently practicing phlebotomists who want to be certified. These courses are designed to prepare students for the national certification examinations in phlebotomy.

		quarter hours
MLS 4104	Introduction to Phlebotomy *† (offered Winter and Summer Quarters in Boston; Spring Quarter in Marshfield)	4
MLS 4108††	Phlebotomy Applied Study** (offered Fall, Winter, Spring, and Summer Quarters)	2

Total Quarter Hours 6

*Pre-registration is recommended as this course frequently closes due to over-enrollment. U.S.A. High School diploma or GED is required. Foreign documents can be evaluated for equivalency. Form is available in the Office of Academic and Student Affairs, 180 RY.

**Prerequisite MLS 4104. MLS 4108 is a 3-week full-time day practicum in an affiliated hospital.

†Special fee, see page 263.

††Do not pre-register for MLS 4108. You can register for MLS 4108 during the quarter you take MLS 4104. You must pass MLS 4104 with a B- or higher to be eligible to take MLS 4108. Must have health clearance through Lane Health Center of Northeastern University. MLS 4104 and MLS 4108 require liability insurance coverage.

Real Estate Salesperson's Exam Preparation

The following course covers the basic principles and terminology of real estate and the practices of real estate brokerage, including appraisal, finance, development, management, and investment. Upon successful completion of these courses, students may take the Massachusetts Real Estate Salesperson's Examination.

		quarter hours
RE 4303	Real Estate Fundamentals Intensive	6

For more information, call 617-373-2418 or 617-373-2419.

Teacher Preparation Programs for Elementary and Secondary Education

You may qualify for University College's Elementary or Secondary Education Teacher Preparation Programs if you **either** are enrolled in a Bachelor's Degree program or have already earned a degree in the Liberal Arts and Sciences. An earned Bachelor's Degree including successful completion of this part-time undergraduate program leads to provisional with advanced standing (first stage) certification in Massachusetts as an Elementary school teacher or a teacher of English, History, Social Studies, Biology or General Science in grades 9 to 12. Standard certification (second stage) requires a master's degree.

Admission Guidelines:

- Applicants must **either** be admitted to a *specified* degree program in University College and have completed three or more courses in a specified Liberal Arts and Sciences major **or** have completed a bachelor's degree program in an appropriate Liberal Arts and Sciences major (for example, History) **and** have at least a 2.500 cumulative average.
- Before applying to this program, students should complete one introductory education course: *ED 4101 Introduction to Education*.
- Students must petition the Department of Education at Northeastern University for admission to this program. Petitions, available at UC's Office of Academic and Student Affairs, 180 Ryder Hall, must be accompanied by an official transcript and a letter of recommendation from an academic advisor, and be sent to Professor Maurice Kaufman, Department of Education, 57 Lake Hall. Petitions must indicate the year and quarter in which you plan to register for *ED 4817 Student Teaching Practicum*.

The Student Teaching Practicum (ED 4817):

- Student teaching is a 5-day per week commitment for one quarter. The Student Teaching Practicum is *not* offered during the summer quarter.
- To be eligible for the Student Teaching Practicum, students must have at least a 2.50 cumulative QPA, a grade of C (2.0) or higher in all professional education courses, **and** must meet minimum academic requirements to remain in the liberal arts major.
- Students completing their bachelor's degree should plan to register for ED 4817 during the senior year (or equivalent) of their program.
- Students must meet with Dr. Kaufman at least one quarter prior to registering for ED 4817 to document that all requirements have been met and to discuss the details of the student teaching assignment. All student teaching placements and supervision assignments are arranged by the NU Department of Education. Students are notified in writing at least six weeks prior to student teaching and will receive a handbook of policies and procedures for student teachers.

Elementary Education Teacher Preparation Program

		quarter hours
ED 4101	Introduction to Education	3
ED 4102	Child Development and Learning	(3)
<i>or</i>	<i>or</i>	
PSY 4240	Development: Infancy and Childhood	(3)
ED 4406	Elementary Curriculum 1: language arts, art, music	3
ED 4407	Elementary Curriculum 2: social studies	3
ED 4408	Elementary Curriculum 3: science and mathematics	3
ED 4426	Fundamentals of Reading	3
CRS 4200	Introduction to Special Education	3
ED 4817	Student Teaching Practicum	8
Total Quarter Hours		29

Secondary Education Teacher Preparation Program

		quarter hours
ED 4101	Introduction to Education	3
ED 4103	Adolescent Development and Learning	(3)
<i>or</i>	<i>or</i>	
PSY 4241	Development: Adolescence	(3)
ED 4410	General Teaching Methods for High School	3
ED 4411	Teaching in the High School (a) Mathematics (b) Science (c) English (d) Social Sciences	3
ED 4412	Curriculum Development in the High School	3
ED 4415	Reading/Learning Problems in Secondary School	3
CRS 4200	Introduction to Special Education	3
ED 4817	Student Teaching Practicum	8
Total Quarter Hours		29

Teacher Preparation in Special Education

The CRS courses are designed to cover the competencies specified for provisional with advanced standing certification as "Teacher of Students with Special Needs (N-9)." The program must be completed along with the program of study leading to Elementary Teacher provisional with advanced standing certification as an elementary teacher (1-6).

		quarter hours
CRS 4202	Introduction to Etiology and Development of Special Needs	3
CRS 4204	Introduction to Assessment, Program Planning, and Implementation in Special Education	3
CRS 4206	Practicum	3
Total Quarter Hours		9

Teacher Preparation in Health Education

This program is intended to meet the requirements for provisional with advanced standing (first stage) teacher certification (grades N-9 or 5-12) in Health Education. Standard certification (second stage) requires a master's degree. **It is only open to those who possess at least a baccalaureate degree and Massachusetts teacher certification in another field.** Prospective students should be aware that a practicum "consisting of a minimum of 150 clock hours earned at the practicum site(s)" is required for Massachusetts Teacher Certification, 603 CMR 7.00: Certification of Educational Personnel. 7.02 General Provisions (11) *Characteristics of a Practicum*, p. 4. This practicum will take place during the regular school year. *No summer practica are possible.*

				quarter hours
BIO 4181	BIO 4182	BIO 4183	Anatomy and Physiology 1, 2, 3	9
HSC 4310	HSC 4311		Public Health 1, 2	6
HSC 4380			Mental Health and Counseling	3
HSC 4475			Methods of School Health Education	3
HSC 4600			Advanced Nutrition	3
HSC 4706			Health Education Practicum	8
PSY 4240			Development: Infancy & Childhood (N-9)	(3)
or			or	
PSY 4241			Development: Adolescence (5-12)	(3)
PSY 4280			Human Sexuality and Love	3
PSY 4352			Drugs and Behavior	3
HMG 4106			First Aid Procedures	2
Total Quarter Hours				43

Graduate School Preparation Programs

Dental Hygiene Post-Baccalaureate Certificate Preparation Program

Forsyth School for Dental Hygienists offers a post-baccalaureate accelerated dental hygiene curriculum. Prerequisites for the program are a bachelor's or master's degree from an accredited college or university, a 3.0 q.p.a. and a number of prerequisite courses. It is possible to take the prerequisites at University College in preparation for application to the Forsyth program. Each course must be completed with a grade of B (3.0) or better.

		quarter hours
BIO 4161/BIO 4165	Human Anatomy and Physiology 1/ Lab for Human Anatomy and Physiology 1	3/1
BIO 4162/BIO 4166	Human Anatomy and Physiology 2/ Lab for Human Anatomy and Physiology 2	3/1
BIO 4163/BIO 4167	Human Anatomy and Physiology 3/ Lab for Human Anatomy and Physiology 3	3/1
BIO 4207/BIO 4210	Microbiology 1/Lab for Microbiology 1	2/1
BIO 4208/BIO 4211	Microbiology 2/Lab for Microbiology 2	2/1
CHM 4133/CHM 4140	Chemical Principles 1/Lab for Chemical Principles 1	3/1
CHM 4134/CHM 4141	Chemical Principles 2/Lab for Chemical Principles 2	3/1
CHM 4135/CHM 4142	Chemical Principles 3/Lab for Chemical Principles 3	3/1
ENG 4100	Critical Writing 1	4
ENG 4111 ENG 4112	Critical Writing 2, 3	6
PSY 4110	Introduction to Psychology: Fundamental Issues	3
PSY 4111	Introduction to Psychology: Developmental Aspects	3
SOC 4100	Roles, Culture and the Individual	3
SOC 4101	Inequality and Institutions	3
HSC 4210	Basic Nutrition	3
CMN 4101	Fundamentals of Human Communication	3

Total Quarter Hours

58

Students interested in learning more about the Post-Baccalaureate Dental Hygiene Program should contact the Admissions Office, Forsyth School for Dental Hygienists, 140 The Fenway, Boston, MA 02115. For more information call 617-262-5200 x212.

Medical/Dental School Preparation

Medical School Admission Requirements

Northeastern University's Health Professions Advisory Committee provides academic advice and help with health professional school applications for students in any of the University's programs. Although advice is available to anyone enrolled in a course, the Committee can prepare evaluation letters only for those who have taken enough coursework at Northeastern to be able to have at least two Northeastern faculty members write letters to the Committee. **Information Sessions are scheduled at the Main Boston Campus during the Fall, Winter, and Spring Open House events. Call 617-373-5796 for the schedule and to reserve a place.** *Sources of Advice:*

- **General Advising, Application Procedures, and Entrance Exams**
 Dr. C. H. Ellis, Jr., Chair
 Health Professions Advisory Committee
 Biology Department
 Northeastern University
 445 Richards Hall
 617-373-4032
 - **Course Schedules and Advising**
 Dr. Shirley M. Russo
 Health Professions Advisory Committee
 Director, Health Professions and Sciences Programs
 University College
 266 Ryder Hall
 617-373-5796
- or
- **Questions on Physics Courses**
 The Lowell Institute at N.U.,
 a division of the School of Engineering Technology
 120 Snell Engineering Center
 617-373-2500
 - **Cornelius O'Leary**
 Director, Office of Academic and Student Affairs
 University College
 180 Ryder Hall
 617-373-2400

Students must complete the courses below before taking the school's particular admission test (MCAT, DAT, and so on. MCAT exam applications are available at the Department of Career Services, 103 Stearns Center, 617-373-2433).

Course Sequences to Meet Minimum Admission Requirements

Completing one sequence from each category should meet the *minimum* requirements of most medical or dental schools. If you have questions about whether other courses might be applicable, talk with the Chair of the Health Professions Advisory Committee. Students are strongly encouraged to contact the medical or dental school(s) in which they are interested to obtain specific guidance on what courses the school may require for admission.

<i>General Biology:</i>	BIO 4107/BIO 4110, BIO 4108/BIO 4111, BIO 4109/BIO 4112 (labs <i>must</i> be taken). Other biology work, such as anatomy and physiology and microbiology, may be acceptable, depending on the professional school. General biology is highly recommended even if you have already taken the other courses.
<i>Chemical Principles:</i>	CHM 4133/CHM 4140, CHM 4134/CHM 4141, CHM 4135/CHM 4142—labs <i>must</i> be taken
<i>Organic Chemistry:</i>	CHM 4251/CHM 4254, CHM 4252/CHM 4255, CHM 4253/CHM 4256—labs <i>must</i> be taken
<i>General Physics:</i>	PHY 4117/PHY 4196*, PHY 4118/PHY 4197,* PHY 4119/PHY 4198* (labs <i>must</i> be taken)
<i>Math:</i>	MTH 4108, MTH 4120, MTH 4121*
<i>English:</i>	ENG 4100, ENG 4111, ENG 4112
	Two additional areas that are often required are behavioral science and biochemistry. The following courses meet these requirements.
<i>Behavioral Science:</i>	PSY 4110, PSY 4111, PSY 4112, and/or other psychology courses
<i>Biochemistry:</i>	CHM 4371, CHM 4372, CHM 4373 or BIO 4246, BIO 4247, BIO 4248

*These courses are scheduled through the Lowell Institute at N.U., a division of the School of Engineering Technology. Call 617-373-2500.

Physical Therapy Preparation Program

This set of U.C. courses may be utilized by students who wish to prepare for entrance into undergraduate and graduate programs in physical therapy. Taking these courses does not guarantee acceptance into Northeastern's or other physical therapy programs, but does represent the typical prerequisites for entering this course of study.

		quarter hours
BIO 4161/BIO 4165	Human Anatomy and Physiology 1/Lab for Human Anatomy and Physiology 1	3/1
BIO 4162/BIO 4166	Human Anatomy and Physiology 2/Lab for Human Anatomy and Physiology 2	3/1
BIO 4163/BIO 4167	Human Anatomy and Physiology 3/Lab for Human Anatomy and Physiology 3	3/1
BIO 4107/BIO 4110	Biology 1/Lab for Biology 1	3/1
BIO 4108/BIO 4111	Biology 2/Lab for Biology 2	3/1
BIO 4109/BIO 4112	Biology 3/Lab for Biology 3	3/1
CHM 4133/CHM 4140	Chemical Principles 1/Lab for Chemical Principles 1	3/1
CHM 4134/CHM 4141	Chemical Principles 2/Lab for Chemical Principles 2	3/1
CHM 4135/CHM 4142	Chemical Principles 3/Lab for Chemical Principles 3	3/1
PHY 4117/PHY 4196	Physics 1/Lab for Physics 1*	4/1
PHY 4118/PHY 4197	Physics 2/Lab for Physics 2*	4/1
PHY 4119/PHY 4198	Physics 3/Lab for Physics 3*	4/1
MTH 4108 MTH 4120 MTH 4121	Pre-Calculus, Calculus 1, 2*	12
ENG 4100	Critical Writing 1	4
ENG 4111 ENG 4112	Critical Writing 2, 3	6
Total Quarter Hours		73

*These courses are offered through the Lowell Institute. Call 617-373-2500 for information.

Speech-Language Pathology and Audiology Pre-professional Preparation

This series of professional courses is designed to offer entry into the dynamic field of speech-language pathology and audiology for a variety of potential students, including: those interested in applying for graduate work who lack the necessary prerequisites, and those who are curious to explore the field as a possible career option. The series is offered exclusively at our Dedham Campus. Days and times can be found in the *Schedule Guides*.

			quarter hours
Fall Quarter	SLA 4101	Introduction to Speech and Hearing	3
	SLA 4300	Language Acquisition	3
Winter Quarter	SLA 4201	Anatomy & Physiology of the Vocal Mechanism	3
	SLA 4303	Introduction to Audiology	3
Spring Quarter	SLA 4101	Introduction to Speech and Hearing	3
	SLA 4301	Phonetics & Developmental Phonology	3

For more information, call 617-373-5796.

Graduate Certificate Programs

University College offers three graduate level certificate programs designed around leading-edge curricula enabling students to immediately apply their studies to workday issues:

- Banking and Financial Services
- Human Resources Management
- Service Industry Security

These programs are designed specifically to meet the complex scheduling needs of adult students. In this fast-paced world, if you need to upgrade your skills, you want to do it quickly. Individuals will be able to complete an entire program in one year (three terms) if you take two courses each term. Classes will meet once a week and are scheduled so that if you choose to take two courses, you can do so on one evening. The courses may generally be taken in any order, and you may proceed at a slower pace if desired.

Admission Requirements

The University College graduate certificate programs are designed for working professionals primarily at the mid-career level who already have relevant work experience. Applicants to the program must hold a bachelor's degree from a regionally accredited college or university, and official transcripts must be provided as part of the application process. Service Industry Security applicants must have a 2.5 q.p.a. in their undergraduate degree. Applicants will usually have some work experience in the banking and financial services, human resources, or security fields for the three programs respectively and must attach a current resume to the application. Applicants are also required to provide a written statement outlining their goals for and expectations of the program and must attach this to the application.

Application Procedures

University College will accept applications on a rolling basis throughout the year. Applications are available by calling the Academic Programs Office at 617-373-2425, TTY 617-373-2825. Applications are due approximately one month prior to the start of each term, (late August, early December, late February, and early May). Northeastern University operates on the quarter system, with terms beginning in late September, early January, late March, and early June. Upon receipt of the completed application, your materials will be reviewed by the Committee on Admission. You should expect to receive notification no later than two weeks prior to the beginning of the term.

It is possible to apply for special student status, which would allow an individual to take one certificate course prior to being accepted into the program. Students with questions about this option should call 617-373-2425 and must file a petition with the Office of Academic and Student Affairs in 180 Ryder Hall.

A special note for international students: International applicants must include a declaration and certification of finances form and TOEFL scores of 580 or better. For U.S. citizens or international students registered in the U.S. as resident aliens who have international educational credentials which need evaluation for admission, please call 617-373-2400 or TTY 617-373-2825 for information on this and other requirements and processing deadlines.

Tuition and Fees

There is a one time application fee of \$25.00. Checks should be made payable to Northeastern University and should accompany the application form.

Tuition is billed at a rate of \$300.00 per quarter hour. There is a one-time \$10.00 registration fee for first-time students. Students also pay a \$5.00 per term graduate activities fee. Please do not enclose payment for courses with your application materials. Once accepted into the program, you will receive information on how to register for courses. For students who have international credentials which need evaluation, there is a \$45.00 processing fee.

For refund policy, see page 262.

Academic Advising

Students in graduate certificate programs are eligible to make use of University support services such as Career Services. University College also has academic advisors available to answer your questions. Call 617-373-2400 or TTY 617-373-2825.

Academic Policies

These certificate programs are designed as free-standing programs, and courses do not transfer into the MBA Programs at Northeastern University. Two specified courses in the Service Industry Security Program will substitute for required courses in the master's degree program in Criminal Justice at Northeastern. Other colleges and universities may recognize these courses for transfer, but these decisions are made independently by the receiving institution.

A cumulative q.p.a. of 3.0 will be required in order for a student to be awarded the certificate.

The equivalent of one course taken at another graduate program (grade of 3.0 or better) may be transferred into a certificate program.

Banking and Financial Services



In this rapidly changing business environment the barriers between institutions are eroding, and competition is increasing due to deregulation and new product development. Managing internal operations more efficiently and effectively and adapting to the changing external environment are critical to the long-term survival and health of financial institutions. Professionals working in this environment must continually upgrade their skills and technical knowledge in order to remain personally competitive.

This program will broaden an understanding of financial institutions by providing a panoramic view of banking and investment services and giving students the tools to assist with day-to-day operations and job responsibilities. Internal backroom operations, such as security, computerization, and their impact on creating a profit center, will be addressed, as will external issues such as deregulation and the opportunities for geographic and product line expansion. The risks inherent in expansion, diversification, and consolidation that are critical to the long-term survival of financial institutions will also be examined.

		quarter hours
FI 3100	Accounting Fundamentals for	
	Financial Institutions	3
FI 3110	Asset and Liability Management	3
FI 3120	Building Financial Relationships	3
FI 3130	Loan Analysis	3
FI 3140	Financial Operations Management	3
FI 3150	Managing Change in the	
	Financial Sector	3

Total (up to 3 q.h. allowed in transfer credit)

18

Courses for this program are scheduled at the Downtown campus.

Human Resources Management


NEW

Human resources professionals must respond to the growing challenges of regulatory compliance, design and oversee complex benefits plans, consult on company downsizing and workforce planning, accommodate flexible work schedules, and meet their company's needs for a highly skilled workforce. Keeping up with these challenges demands leading-edge technical knowledge and the ability to apply that knowledge in the work setting. The courses in this program will blend theoretical approaches with practical applications, using a variety of methods including case studies, individual and group student projects, and class discussion.

		quarter hours
HRM 3100	Organizational Behavior	3
HRM 3110	Total Compensation	3
HRM 3120	Strategic Recruitment, Training and Performance Management	3
HRM 3130	Employee Rights and Employer Obligations	3
HRM 3140	High-Performance Human Resources Systems and Development	3
HRM 3150	Change, Challenge, and Competence	3

Total (up to 3 q.h. allowed in transfer credit) **18**

Courses for this program are scheduled at the Downtown campus.

Service Industry Security


NEW

Security is a sophisticated management function that is central to the smooth operation of any complex organization. Service industry sites must protect guests or patients and their valuables, provide for privacy and physical safety, protect confidential information, protect large physical plants, and monitor large quantities of equipment and supplies. Hospitals, clinics, nursing homes and other health agencies, as well as hotels, properties under corporate management, and other lodging facilities—all have similar security issues which will be addressed in this program.

		quarter hours
CJ 3100	Introduction to Service Industry Security	3
CJ 3110	Management of Service Industry Security Departments	3
CJ 3120	Preventing Service Industry Losses	3
CJ 3130	Computer Security for the Service Industry	3
CJ 3140	Security's Role in Safety and Environmental Protection for the Service Industry	3
CJ 3150	Interpersonal Relationships in the Service Industry	3

Total (up to 3 q.h. allowed in transfer credit) **18**

Courses for this program are scheduled at the Main Boston campus.

Course Descriptions for Graduate Certificate Programs

Criminal Justice

CJ 3100 Introduction to Service Industry Security (3 q.h.)

Introduces the organization and administration of programs designed to protect and conserve the assets of hospitality and health care industry facilities. Emphasizes security's contribution to prevent or minimize losses that can affect the quality of service and care of guests and patients. *Coreq. normally this course will be taken together with CJ 3110.*

CJ 3110 Management of Service Industry Security Departments (3 q.h.)

Considers the organization, staffing, training, and supervision of hospitality and health care industry security departments, and the management of their financial, human, and physical resources in order to provide optimum protection for minimum expense. Examines the responsibilities of security personnel, the authority needed for their discharge, and the legal issues that relate to security department operations. *Coreq. normally this course will be taken together with CJ 3100.*

CJ 3120 Preventing Service Industry Losses (3 q.h.)

Examines the integration of hospitality and health care industry security into the total workplace environment and the preventing and minimizing of losses. Emphasizes purchasing, food and beverage operations, housekeeping, engineering, and laundry operations in both cases, and pharmacy operations in medical centers and nursing homes. *Prereq. CJ 3100 and CJ 3110; waived with permission.*

CJ 3130 Computer Security for the Service Industry (3 q.h.)

Studies the need to protect computers and the data generated thereby and stored therein, dealing with guest and patient registration, records, departures and discharges, financial transactions, as well as data pertaining to a hotel's or medical center's op-

erations and business activities, and in the health care industry, information regarding patient medications and treatment. *Prereq. CJ 3100 and CJ 3110; waived with permission.*

CJ 3140 Security's Role in Safety and Environmental Protection for the Service Industry (3 q.h.)

Studies how the security function can promote and assist the development and implementation of effective safety and environmental protection programs that contribute to guest comfort, patient care, and profits. Topics include the legal issues, the penalties that can be assessed as a result of noncompliance, the impact that this can have on reputation, and minimizing the risk of violent acts and harm to medical center personnel caused by careless storage or disposition of hazardous waste. *Prereq. CJ 3100 and CJ 3110; waived with permission.*

CJ 3150 Interpersonal Relationships in the Service Industry (3 q.h.)

Examines the importance of security managers and personnel who work in the hotel and health care industries, being able to develop and maintain good relationships with their co-workers and more importantly, relating to and understanding the needs of hotel guests and concerns of hospital patients, their families and friends, without reducing their effectiveness in protecting and conserving the employer's assets. *Prereq. CJ 3100 and CJ 3110; waived with permission.*

Finance

FI 3100 Accounting Fundamentals for Financial Institutions (3 q.h.)

Financial statements of a variety of financial institutions are analyzed with an emphasis on understanding the accounting structure of financial institutions, ratio analysis to evaluate financial performance, and control systems.

FI 3110 Asset and Liability Management (3 q.h.)

In-depth analysis of the management of assets and liabilities to meet the goals of the financial institution, including maximizing shareholder wealth and meeting regulatory requirements. Includes cash needs based on regulations and liquidity requirements, short-term and long-term investment alternatives, management of short-term and long-term liabilities, the role of capital in both a regulated and unregulated environment, and management of the size of the balance sheet via off-balance sheet financing and securitization.

FI 3120 Building Financial Relationships (3 q.h.)

Financial institutions must offer a growing array of products, packaged and priced to appeal to a variety of customers. This course examines the variety of financial products available, product packaging and pricing decisions, cross-selling, and relationship building.

FI 3130 Loan Analysis (3 q.h.)

Examines the use of financial statements by lenders. Emphasis on using financial statements to analyze liquidity, solvency, capital adequacy, and performance of the borrower. Students will use spreadsheets to calculate and interpret ratios and to evaluate the cash flow position and the quality of earnings.

FI 3140 Financial Operations Management (3 q.h.)

Examines management of the backroom operations; the implications of technology, electronic data interchange, and the impact of the introduction of new products on operations.

FI 3150 Managing Change in the Financial Sector (3 q.h.)

Using case studies and examples from the financial press, students will look at how innovation, product development, pricing, technology, and service become part of a successful strategy for a financial services firm.

Human Resources Management

HRM 3100 Organizational Behavior (3 q.h.)

Studies the behavioral dynamics of the workplace and examines the relationship of individuals and groups to the organization. Major topics include motivation, perception, interpersonal communication, leadership, power and influence, decision making, group dynamics, team building, corporate culture and socialization. Emphasizes practical application of specific skills, theories, and concepts.

HRM 3110 Total Compensation (3 q.h.)

Investigates the procedures used to determine the compensation package, including merit and incentive plans, wage and salary structure and compensation methods. Other topics include managing indirect compensation and the importance of providing innovative, comprehensive, and cost-efficient benefits packages; the impact on compensation and benefits of reengineering; team-based reward systems; flexible benefit plans; new ways of packaging compensation and benefits; and teaching employees about indirect compensation.

HRM 3120 Strategic Recruitment, Training and Performance Management (3 q.h.)

Topics covered include strategies for attracting and keeping the best people; assessing the selection process; helping managers to clarify their needs; interviewing and selection; communication; negotiation; performance appraisals; and evaluating training and retraining needs.

HRM 3130 Employee Rights and Employer Obligations (3 q.h.)

Using case studies, examines the legal relationship between employer and employee, addressing issues and topics such as discrimination, affirmative action, the Americans with Disabilities Act, sexual harassment, health and safety, AIDS in the workplace, compliance issues, and legal issues related to downsizing and terminations.

HRM 3140 High-Performance Human Resources Systems and Development (3 q.h.)

Examines the human resources management role as internal consultants, problem solvers, and change agents in the organization.

With organizations changing so rapidly, there is a tremendous need to manage information, technology and systems, people, and the overall organization toward customer- or client-centered effectiveness. Linking human resources planning to the strategic business plan is vital to meeting changing organizational demands for adaptation and improvement. This course examines the critical role played by human resources managers in facilitating transition, growth, adaptation, and organizational learning.

HRM 3150 Change, Challenge, and Competence (3 q.h.)

Human resources managers and professionals must address new tensions and challenges arising from employer demands for higher productivity within complex, increasingly competitive environments. Topics covered include changes in the workforce, cultural diversity, changing work/family patterns, worker burnout and stress, and the need for workplace flexibility. Also addresses changes in the workplace, from internationalization to reorganization and the impact of downsizing.

Business Administration Degree Programs

Todd J. Leach
*Director,
 Business Administration Programs*

270 Ryder Hall
 617-373-2418, 617-373-2419
 617-373-2825 (TTY)

Agnes Jordan
*Assistant Director,
 Business Administration Programs*

Program Consultants

ACC: Accounting

Consultant: Professor Paul A. Janell (College of Business Administration) (617-373-4645)
Associate Consultant (Accounting Principles):
 Walter E. Kearney, Jr. (Director of Operations, University College) (617-373-8306)

BL: Business Law

Consultant: Thomas J. Ahern, Esq.
 (617-426-4211)

FI: Finance

Consultant: Professor Jonathan Welch (College of Business Administration) (617-373-5961)
Associate Consultant: Joseph Stanford
 (617-383-9299)
Associate Consultant: Robert T. Trimper
 (508-443-6518)

HRM: Human Resources Management

Consultant: Professor Brendan Bannister
 (College of Business Administration)
 (617-373-2503)
Associate Consultant: Kenneth C. Solano
 (617-373-5664)

HTL: Hotel and Restaurant Management

Consultant: Donald A. Witkoski
 (508-362-2131, x361)

MGT: Management

Consultant: Professor James E. Molloy
 (College of Business Administration)
 (617-373-4812)
Associate Consultant:
 Robert L. Goldberg (617-373-4737)

MIS: Management Information Systems

Consultant: Professor Victor Godin (College of Business Administration) (617-373-2418)
Associate Consultant (Introduction):
 Michael E. Gladstone (617-373-3303)
Associate Consultant (Programming):
 Richard H. Saracusa (617-446-5228)
Associate Consultant (Systems):
 Edward Sousa (617-373-2335)
Associate Consultant (Computer Systems Specialist Programs):
 Alan M. Tattle (617-598-3944)

MKT: Marketing

Consultant: Professor Dan T. Dunn, Jr. (College of Business Administration) (617-373-4563)
Associate Consultant: Ronald J. McBrien
 (617-373-4745)

OM: Operations Management, Operations Technology, and Purchasing

Consultant: Professor Robert A. Parsons
 (College of Business Administration)
 (617-373-4749)
Associate Consultant:
 Stephen F. Armstrong (508-281-2000 x2519)

RE: Real Estate

Consultant: Peter Flynn (617-233-2284)

TRN: Logistics and Transportation

Consultant: Professor James F. Molloy (College of Business Administration) (617-373-4812)

A Wide Variety of Quality Programs: Preparing Students for the Challenge of Business

For generations, students in Northeastern University's part-time business programs have been successfully prepared to meet the challenges faced in the business professions. As the demands of the corporate world have changed, and the need for new skills has become evident, Northeastern has consistently demonstrated its ability to match the content of its academic offerings with the needs of men and women in business.

Today—perhaps more than ever—the professional competence ensured through the study of Northeastern's business programs is necessary for getting and keeping a position in the business world. Additionally, our business programs lay the foundation for long-range advancement.

What is found to be of greatest importance to contemporary career success is the quality of the chosen program of study. Northeastern's part-time bachelor's degree program in Business Administration is **fully accredited by the American Assembly of Collegiate Schools of Business**, the most prestigious accrediting organization of university business degrees in the United States. Our degree programs have been carefully structured to meet all the standards established by the AACSB.

University College's Bachelor of Science in Business Administration degree programs are described on page 75.

Certificates in Business

Individuals can pursue a certificate program to build on or prepare for a new career, to qualify for a promotion, to stay current in a chosen field, or simply to acquire new skills and knowledge. Some individuals enroll in a certificate program as part of their traditional degree program. University College offers certificates in the following business program areas:

Business Administration

- Accounting (page 40)
- Advanced Accounting (page 55)
- Banking and Financial Services
 - graduate-level (page 67)
- Business Administration (page 41)
- Compensation and Benefits Management (page 42)
- Computer Certificates
 - Computer Programming and Software Development (page 44)
 - Computer Programming and Systems Analysis (page 44)
 - Computer Systems Specialist Program (page 45)
 - Microcomputer Software (page 50)
 - UNIX for Business (page 54)
- Finance (page 47)
- Human Resources Management
 - undergraduate-level (page 48)
 - graduate-level (page 68)
- International Business and Culture (page 48)
- Management (page 49)
- Marketing (page 50)
- Small Business Management and Entrepreneurship (page 51)
- Supply Chain Management (page 52)

National Certification—CTL (Certified in Transportation and Logistics)

Students may waive portions of examinations through the study of appropriate University College courses. See page 58.

Preparation for National Certification—APICS and NAPM

Clusters of courses are being offered to prepare students for the national examinations leading to the titles of Certified Production and Inventory Control Manager (CPIM) and Certified Purchasing Manager (C.P.M.). See pages 58-59 for details.

Real Estate Salesperson's Exam Preparation

Individuals interested in preparing for the Massachusetts Real Estate Salesperson's Examination may take the courses detailed on page 59.

Degree Programs

Associate in Science Degrees (AS)

Through a core of professional business courses and a well-balanced sequence of liberal arts courses, students in the associate in science degree programs acquire specialized knowledge for future managerial growth.

To receive the associate's degree, a student must successfully complete the 87 quarter hours of course credit specified for the degree. Students who have completed a certificate program may then enroll in an associate's degree program. (Although credits earned in a certificate program may be applied toward this degree, completion of a certificate program is not required.)

Students who wish to earn one of the associate in science degrees in business and who have not earned 80 quarter hours of credit are required to enroll in the Open Business courses listed on pages 77-78.

The final examinations of certain open Business courses (see asterisked courses on pages 77-78) are used for course validation in the Bachelor of Science in Business Administration (BSBA) Degree programs. The students in these classes must earn a "C" or above in the final validating examination for the course to be accepted in the BSBA program. Please consult course instructor or call 617-373-2418 or 617-373-2419 for further details.

Associate's degrees are offered in the following areas:

Business Administration

- Accounting (page 79)
- Business Administration (page 80)
- Finance (page 81)
- Human Resources Management (page 82)
- Logistics and Transportation (page 83)
- Management Information Systems (page 84)
- Marketing (page 85)
- Operations Management (page 86)
- Purchasing and Materials Management (page 87)

Accreditation by the American Assembly of Collegiate Schools of Business

University College's Bachelor of Science in Business Administration degree is fully accredited by the American Assembly of Collegiate Schools of Business, indicating that the programs meet the accrediting agency's standards for faculty and student quality, curriculum design and overall University support.

Bachelor of Science in Business Administration: BSBA Degree

University College offers a Bachelor of Science in Business Administration degree with concentrations in these areas:

- Accounting (page 88)
- Finance (page 90)
- Management (page 92)
- Management Information Systems (page 94)
- Marketing (page 96)

The Bachelor of Science in Business Administration degree programs of University College are designed for men and women seeking to prepare themselves for managerial responsibility in business, government, and other organizations with the goal of developing the ability to recognize and solve problems and to understand the role of the business firm in the community, the nation, and the world. In developing these skills, students have the opportunity to gain not only a broad understanding of business and organizational problems through specialized courses, but also first-hand knowledge from effective full-time College of Business Administration professors as well as working professionals who are also teachers.

To ensure a well-rounded background that is so valuable in the business world, the college combines its business curriculum with courses from the sciences, humanities, and social sciences.

After the coursework foundation is completed, (See "Planning Your Program of Study Toward a Bachelor of Science in Business Administration Degree," below) the various functional areas of business are emphasized, and students concentrate their studies in specific areas. (Detailed descriptions of these areas follow this section.) In most of these upper-level courses, the traditional lecture-and-recitation format is supplemented by problem-solving and case-study methods where students analyze actual businesses and business problems and present recommendations for possible solutions.

Planning Your Program of Study Toward a Bachelor of Science in Business Administration Degree

Students who plan to work toward the Bachelor of Science in Business Administration degree should submit transcripts of previously completed college-level coursework and a Transfer Credit Petition to the Office of Academic and Student Affairs. (Transfer Credit Petitions may be requested by calling 617-373-2400 or TTY 617-373-2825. Petitions are also available at all campus locations.) Students will receive by mail a transfer credit evaluation and a suggested plan of study to prepare for admission to this program. When this paperwork has been completed, students are encouraged to schedule an appointment to discuss their programs with an academic advisor.

Admissions Application Procedure

Students who do not have any academic courses that may be transferred from another educational institution or program should meet with an academic advisor early in their studies at University College. All students are required to complete 80 quarter hours of credit, including English courses ENG 4100, ENG 4111, and ENG 4112; mathematics courses MTH 4110 and MTH 4111; and a social science elective from the course list that follows. This coursework must be completed prior to application for admission to the BSBA degree program (may include transfer credit).

Once students have met these requirements, they should complete an Admissions Application to the Bachelor of Science in Business Administration Degree program and return it to the Office of Academic and Student Affairs to initiate the admissions process. This application may be obtained at all campus locations or by calling 617-373-2400 or TTY 617-373-2825.

Admission to the BSBA Degree program is restricted to students who have maintained a 2.0 cumulative grade-point average at University College and completed a minimum of 80 quarter hours of credit.

Students should choose their 80 quarter hours of credit from the recommended lower-level course list that follows:

ACC 4101	ACC 4102	ACC 4103	Accounting Principles 1, 2, 3
BL 4101	BL 4102		Law 1, 2
CMN 4101			Fundamentals of Human Communication
ECN 4115	ECN 4116	ECN 4117	Economic Principles and Problems 1, 2, 3
ECN 4250	ECN 4251		Statistics 1, 2
ENG 4100			Critical Writing 1
ENG 4111	ENG 4112		Critical Writing 2, 3
ENG 4380	ENG 4381		Writing for the Professions 1, 2
HST 4101			The Civilization of the Ancient and Medieval Worlds

One History course from the following:
(HST 4102, 4103, 4201, 4202, 4203, 4600 through 4646)

MGT 4101	MGT 4102	Introduction to Business and Management 1, 2
MIS 4114		Introduction to PC Software
MIS 4115		Introduction to Computers and Information Systems
MTH 4110	MTH 4111	Contemporary Algebra 1, 2
PHL 4100		Philosophical Thinking
PSY 4110		Introduction to Psychology: Fundamental Issues
One Psychology elective (PSY)		
SOC 4100		Roles, Culture, and the Individual
SOC 4101		Inequality and Institutions
or		or
SOC 4102		Institutions and Social Change
3 quarter hours of a natural science elective (BIO, CHM or ESC)		
CD 4100 Managing Career Decisions—strongly suggested elective		

Special Requirements for BSBA Degree Programs

The following procedures assure that University College's BSBA programs conform to AACSB standards:

1. Reserved and Open Courses

Business courses in the BSBA programs are classified as either *reserved* or *open*. Reserved courses are upper-level and are restricted to students who have enrolled in the BSBA degree program. To be qualified to register for a reserved course, the student must have earned a total of 80 or more credits (including transfer credits). Reserved courses are offered at the Boston, Burlington, Dedham, Framingham, Weymouth, and Downtown campuses. A student may register for an open course anytime, providing he or she has fulfilled the prerequisites. The final examinations of certain open Business courses (see asterisked courses, below and next page) are used for course validation in the Bachelor of Science in Business Administration (BSBA) degree programs. The students in these classes must earn a "C" or above in the final validating examination for the course to be accepted in the BSBA program. Please consult course instructor or call 617-373-2418 or 617-373-2419 for further details.

2. Validation

Validation is the term used to describe procedures that test whether an open course completed at the lower division of a bachelor's program should be accepted for transfer credit into the upper division of an AACSB-approved bachelor's degree program. There are three approved validation methods:

- **Sequential Course.** Students who enroll in a Bachelor of Science in Business Administration Degree program can validate a course taken at University College or elsewhere by successfully completing a course that is sequential to the course already completed. The sequential course must be taken in a reserved section. For example, successful completion of *Organizational Behavior 2* in a reserved course can validate *Organizational Behavior 1*, regardless of where the student completed *Organizational Behavior 1*.

- **College-Level Examination Program (CLEP) and/or Proficiency Examination Program (PEP).** These standard examinations can be used to validate some previously taken upper-level business courses.

- **Departmental Examination.** In cases where a sequential course does not exist or is not desired by a student, and no appropriate CLEP or PEP examination exists, validation can be accomplished through a departmental examination.

Required upper-level courses are listed as follows under Reserved and Open Sections.

OPEN BUSINESS COURSES

Open business courses are available on an open enrollment basis as long as the stated prerequisites are met.

ACC 4301	ACC 4302	ACC 4307	Intermediate Accounting 1, 2, 3
ACC 4310			Cost Accounting 1
FI 4301*			Principles of Finance
FI 4302*			Financial Management
FI 4310			Investment Principles
FI 4320			Credit Principles
FI 4325			Budgeting and Planning

*The final examinations of these open business courses are used for course validation in the Bachelor of Science in Business Administration (BSBA) degree programs. The students in these classes must earn a "C" or above in the final validating examination for the course to be accepted in the BSBA program.



HRM 4301*		Organizational Behavior 1
HRM 4302*		Organizational Behavior 2
HRM 4304*		Organizational Behavior 1 and Organizational Behavior 2 (Intensive)
HRM 4310*		Human Resources Management
MIS 4301	MIS 4302	Structured Systems Analysis and Design 1, 2
MIS 4305		Structured Systems Analysis and Design (Intensive)
MIS 4307		Communications and Networking
MKT 4301*	MKT 4302*	Introduction to Marketing 1, 2
MKT 4310		Advertising Management 1
MKT 4315		Professional Selling Skills
MKT 4320*		Marketing Management

*The final examinations of these open business courses are used for course validation in the Bachelor of Science in Business Administration (BSBA) degree programs. The students in these classes must earn a "C" or above in the final validating examination for the course to be accepted in the BSBA program.

RESERVED BUSINESS COURSES

The courses below are offered for students in the Bachelor of Science degree programs and for those students who have earned 80 quarter hours of college credit. Please note appropriate course prerequisites.

ACC 4400		Accounting Information Systems
ACC 4408		Intermediate Accounting 4
ACC 4411		Cost Accounting 2
ACC 4425	ACC 4426	Auditing 1, 2
ACC 4440	ACC 4441	Federal Income Taxes 1, 2
FI 4403		Financial Strategy
FI 4411		Investment Management
FI 4421		Credit Management
FI 4426		Financial Control
FI 4450		International Finance
HRM 4415		Leadership
MGT 4410		Project Management Process: Planning and Implementation
MGT 4446		International Business
		Management and Operations
MGT 4450**	MGT 4451**	Business Policy 1, 2
MGT 4452**		Business Policy (Intensive)
MGT 4455		Manager and Society
MIS 4445		Database Management Systems
MIS 4446		Information Systems for Management
MIS 4485		Applied MIS Development Project
MKT 4411		Advertising Management 2
MKT 4416		Strategic Sales Management
MKT 4430	MKT 4431	Marketing Research 1, 2
MKT 4453		International Marketing
MKT 4457		Competitive Strategy
OM 4404		Service Operations Management

**Must have 130 q.h. to register.

Special Studies

University College offers a variety of Special Studies. These courses give students an opportunity to earn credits in Advanced Tutorials, Independent Studies, and Honors Programs for Business. Consult course descriptions on pages 159-260.

University College/New England Banking Institute Articulation Agreement

To keep pace with the professional challenges that bankers face today, particularly in the area of technology, University College and The New England Banking Institute (NEBI) have developed an articulation agreement for the admission of NEBI's students into University College's Bachelor of Science degree. Graduates of NEBI's associate's degree program will have all their credits with a grade of C or above transfer into the MIS BSBA concentration. In addition, other concentrations may also be considered under this agreement.

New England Banking Institute students who are interested in transferring into a University College Bachelor of Science degree should contact an academic advisor at University College at 617-373-2400 or TTY 617-373-2825.

Accounting Associate in Science Degree (Major Code 470)



See also: Accounting Bachelor of Science in Business Administration Degree, page 88.

Core Courses

Liberal Arts

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
MTH 4110 MTH 4111	Contemporary Algebra 1, 2 6
ECN 4115 ECN 4116 ECN 4117	Economic Principles and Problems 1, 2, 3 9
PSY 4110	Introduction to Psychology: Fundamental Issues 3

Business Administration

BL 4101 BL 4102	Law 1, 2 6
FI 4301	Principles of Finance 3
HRM 4301 HRM 4302	Organizational Behavior 1, 2 6
MGT 4101 MGT 4102	Introduction to Business and Management 1, 2 6
MIS 4114	Introduction to PC Software 3
MIS 4115	Introduction to Computers and Information Systems 3

Major Concentration Courses

ACC 4101 ACC 4102 ACC 4103	Accounting Principles 1, 2, 3 9
ACC 4301 ACC 4302 ACC 4307	Intermediate Accounting 1, 2, 3 9
ACC 4310	Cost Accounting 1 3

Nonbusiness Electives	11
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Total Quarter Hours	87
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Business Administration Associate in Science Degree (Major Code 401)



See also: Management Bachelor of Science in Business Administration Degree,
page 92.

Core Courses

Liberal Arts

				quarter hours
ENG 4100			Critical Writing 1	4
ENG 4111	ENG 4112		Critical Writing 2, 3	6
MTH 4110	MTH 4111		Contemporary Algebra 1, 2	6
ECN 4115	ECN 4116	ECN 4117	Economic Principles and Problems 1, 2, 3	9
PSY 4110			Introduction to Psychology: Fundamental Issues	3

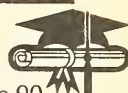
Business Administration

ACC 4101	ACC 4102	ACC 4103	Accounting Principles 1, 2, 3	9
BL 4101	BL 4102		Business Law 1, 2	6
FI 4301			Principles of Finance	3
FI 4302			Financial Management	3
HRM 4301	HRM 4302		Organizational Behavior 1, 2	6
HRM 4310			Human Resources Management	3
MIS 4114			Introduction to PC Software	3
MIS 4115			Introduction to Computers and Information Systems	3
MKT 4301			Introduction to Marketing 1	3
MGT 4101	MGT 4102	MGT 4103	Introduction to Business and Management 1, 2, 3	9

Nonbusiness Electives 11

Total Quarter Hours 87

Finance Associate in Science Degree (Major Code 476)



See also: Finance Bachelor of Science in Business Administration Degree, page 90.

Core Courses

Liberal Arts

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111	Critical Writing 2, 3 6
ENG 4112	Contemporary Algebra 1, 2 6
MTH 4110	Economic Principles and Problems 1, 2, 3 9
MTH 4111	Introduction to Psychology: Fundamental Issues 3
ECN 4115	
ECN 4116	
ECN 4117	
PSY 4110	

Business Administration

ACC 4101	ACC 4102	ACC 4103	Accounting Principles 1, 2, 3 9
BL 4101	BL 4102		Law 1, 2 6
HRM 4301	HRM 4302		Organizational Behavior 1, 2 6
MGT 4101	MGT 4102		Introduction to Business and Management 1, 2 6
MIS 4114			Introduction to PC Software 3
MIS 4115			Introduction to Computers and Information Systems 3
MIS 4236			Advanced PC Software 3

Major Concentration Courses

FI 4301	Principles of Finance 3
FI 4302	Financial Management 3
FI 4310	Investment Principles 3
FI 4320	Credit Principles 3
FI 4325	Budgeting and Planning 3

Nonbusiness Electives	8
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Total Quarter Hours	87
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Human Resources Management Associate in Science Degree (Major Code 477)



Core Courses

Liberal Arts

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
MTH 4110 MTH 4111	Contemporary Algebra 1, 2 6
ECN 4115 ECN 4116 ECN 4117	Economic Principles and Problems 1, 2, 3 9
PSY 4110	Introduction to Psychology: Fundamental Issues 3

Business Administration

ACC 4101 ACC 4102	Accounting Principles 1, 2 6
BL 4101	Law 1 3
MGT 4101 MGT 4102	Introduction to Business and Management 1, 2 6
MIS 4114	Introduction to PC Software 3
MIS 4115	Introduction to Computers and Information Systems 3
MKT 4301	Introduction to Marketing 1 3
MIS 4236	Advanced PC Software 3

Major Concentration Courses

HRM 4301 HRM 4302	Organizational Behavior 1, 2 6
HRM 4310	Human Resources Management 3
HRM 4321	Wage and Salary Administration 3
HRM 4322	Employee Benefits 3
HRM 4325	Training and Development 3
HRM 4333	Employment Rights 3
HRM 4348	The Changing Work Force 3

Nonbusiness Electives	8
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Total Quarter Hours	87
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Logistics and Transportation

Associate in Science Degree (Major Code 482)



Logistics and Transportation is one of the most rapidly expanding fields in business today. All companies, from the Fortune 500 manufacturer to the small retail firm have a logistics department that determines inventory policy, manages warehousing needs, and decides modes of transportation to be used for the distribution of products and materials.

Courses in the Logistics and Transportation associate's degree address operations and distribution issues related to local and international shippers and carriers and financial and legal issues concerning the transportation service consumer.

Corporations and companies (carriers) that sell transportation services seek out individuals who are skilled in the area of logistics and transportation. Carrier companies include the airlines, railroads, trucking companies, and urban transit systems. Students may also consider administrative positions in companies and agencies involved in transportation infrastructure.

On completion of the Logistics and Transportation associate's degree, students may consider pursuing a bachelor's degree in finance, marketing, or another functional area.

Core Courses

Liberal Arts

			quarter hours
ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
MTH 4110	MTH 4111	Contemporary Algebra 1, 2	6
ECN 4250	ECN 4251	Statistics 1, 2	6
ECN 4115	ECN 4116	Economic Principles and Problems 1, 2, 3	9
	ECN 4117		

Business Administration

ACC 4101	ACC 4102	Accounting Principles 1, 2	6
MGT 4101	MGT 4102	Introduction to Business and Management 1, 2	6
MKT 4301		Introduction to Marketing 1	3
MIS 4114		Introduction to PC Software	3
MIS 4115		Introduction to Computers and Information Systems	3
OM 4301 (formerly IM 4301)		Introduction to Operations Management	(3)
or		or	
OM 4404*		Service Quality Management	(3)
OM 4325 (formerly MS 4325)		Business Decision Models	3

Major Concentration Courses

TRN 4301	Elements of Transportation	3
TRN 4302	Introduction to Logistics	3
TRN 4304	Advanced Logistics	3
Transportation electives		12

Nonbusiness Electives 8

Total Quarter Hours 87

*See page 237 for prerequisites. Take as one of last courses in A.S. program after acquiring 80 q.h.

Management Information Systems Associate in Science Degree (Major Code 475)



See also: Management Information Systems Bachelor of Science in Business Administration, page 94.

Core Courses

Liberal Arts

			quarter hours
ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
MTH 4110	MTH 4111	Contemporary Algebra 1, 2	6
ECN 4250	ECN 4251	Statistics 1, 2	6
ECN 4115	ECN 4116	Economic Principles and Problems 1, 2, 3	9
	ECN 4117		

Business Administration

ACC 4101	ACC 4102	Accounting Principles 1, 2	6
FI 4301		Principles of Finance	3
HRM 4301	HRM 4302	Organizational Behavior 1, 2	6
MGT 4101		Introduction to Business and Management 1	3
OM 4404*		Service Operations Management	3

Major Concentration Courses

MIS 4114		Introduction to PC Software	3
MIS 4115		Introduction to Computers and Information Systems	3
MIS 4221	MIS 4222	COBOL Programming 1, 2	(6)
or		or	
MIS 4276	MIS 4277	C Programming 1, 2	(6)
MIS 4236		Advanced PC Software	3
MIS 4273		PC DOS	(3)
or		or	
MIS 4282		Operating Systems Overview	(3)
MIS 4301	MIS 4302	Structured Systems Analysis and Design 1, 2	6
MIS 4307		Communications and Networking	3

Electives** 8

Total Quarter Hours 87

*See page 237 for prerequisites. Take as one of last courses in A.S. program after acquiring 80 q.h.

**Telecommunications, Communications and Unix Programming Certificate Electives:

Your choice of one of the following Center for Continuing Education non-credit certificates will be accepted into the Management Information Systems AS and BSBA and the Operations Management AS and Operations Technology BS:

Communications Systems
Data Communications Systems
Telecommunications Systems
Unix Programming non-credit

Each certificate is equivalent to 18 q.h. of credit and is considered nonbusiness.

Marketing Associate in Science Degree (Major Code 479)



See also: Marketing Bachelor of Science in Business Administration Degree, page 96.

Core Courses

Liberal Arts

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
MTH 4110 MTH 4111	Contemporary Algebra 1, 2 6
ECN 4115 ECN 4116 ECN 4117	Economic Principles and Problems 1, 2, 3 9
ENG 4380	Writing for the Professions 1 3

Business Administration

ACC 4101 ACC 4102	Accounting Principles 1, 2 6
FI 4301	Principles of Finance 3
FI 4302	Financial Management 3
HRM 4301 HRM 4302	Organizational Behavior 1, 2 6
MGT 4101 MGT 4102	Introduction to Business and Management 1, 2 6
MIS 4114	Introduction to PC Software 3
MIS 4115	Introduction to Computers and Information Systems 3

Major Concentration Courses

MKT 4301 MKT 4302	Introduction to Marketing 1, 2 6
MKT 4308	Direct Response Marketing 3
MKT 4310	Advertising Management 1 3
MKT 4315	Professional Selling Skills 3
MKT 4320	Marketing Management 3

Nonbusiness Electives	11
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Total Quarter Hours	87
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Operations Management Associate in Science Degree (Major Code 491)



Core Courses

Liberal Arts

			quarter hours
ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
ECN 4115	ECN 4116	Economic Principles and Problems 1, 2, 3	9
	ECN 4117	Statistics 1, 2	6
ECN 4250	ECN 4251	Contemporary Algebra 1, 2	6
MTH 4110	MTH 4111		

Business Administration

ACC 4101	ACC 4102	Accounting Principles 1, 2	6
HRM 4301		Organizational Behavior 1	3
MGT 4101		Introduction to Business and Management 1	3
MIS 4114		Introduction to PC Software	3
MIS 4115		Introduction to Computers and Information Systems	3

Major Concentration Courses

OM 4325* (formerly MS 4325)	Business Decision Models	3
OM 4301	Introduction to Operations Management	(3)
<i>or</i>	<i>or</i>	
OM 4404**	Service Operations Management	(3)
OM 4314	Productivity Enhancement and Quality	3
OM 4321 (formerly PUR 4321)	Operations Planning and Control	3
OM 4351 (formerly PUR 4351)	Introduction to Purchasing	3
OM 4396 (formerly PUR 4396)	Systems and Technologies	3
TRN 4302	Introduction to Logistics	3

Nonbusiness Electives

17

Total Quarter Hours

87

*Not a prerequisite for OM 4404.

**See page 237 for prerequisites. Take as one of the last courses in A.S. program after acquiring 80 q.h.

Purchasing and Materials Management Associate in Science Degree (Major Code 431)



Core Courses

Liberal Arts

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111	Critical Writing 2, 3 6
MTH 4110	Contemporary Algebra 1, 2 6
ECN 4250	Statistics 1, 2 6
ECN 4115	Economic Principles and Problems 1, 2, 3 9

Business Administration

ACC 4101	Accounting Principles 1, 2 6
HRM 4301	Organizational Behavior 1 3
MGT 4101	Introduction to Business and Management 1, 2 6
MIS 4114	Introduction to PC Software 3
MIS 4115	Introduction to Computers and Information Systems 3
MKT 4301	Introduction to Marketing 1 3
OM 4301 (formerly IM 4301)	Introduction to Operations Management (3)
or	or
OM 4404*	Service Operations Management (3)
OM 4325 (formerly MS 4325)	Business Decision Models 3

Major Concentration Courses

OM 4321	Operations Planning and Control 3
OM 4351 (formerly PUR 4351)	Introduction to Purchasing 3
OM 4357 (formerly PUR 4357)	Business Negotiations 3
OM 4358 (formerly PUR 4358)	Materials Requirements Planning 3
OM 4370 (formerly PUR 4370)	Inventory Management 3
OM 4390 (formerly PUR 4390)	Just-in-Time Manufacturing (JIT) (3)
or	or
OM 4395 (formerly PUR 4395)	Master Production Scheduling (3)
or	or
OM 4396 (formerly PUR 4396)	Systems and Technologies (3)

Nonbusiness Electives 8

Total Quarter Hours 87

*See page 237 for prerequisites. Take as one of last courses in A.S. program after acquiring 80 q.h.

Bachelor of Science in Business Administration Degrees

Accounting Bachelor of Science in Business Administration Degree (Major Code 460)



See also: Accounting Associate in Science Degree, page 79.

Liberal Arts

			quarter hours
ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
MTH 4110	MTH 4111	Contemporary Algebra 1, 2	6
ENG 4380	ENG 4381	Writing for the Professions 1, 2	6
ECN 4115	ECN 4116	Economic Principles and	
	ECN 4117	Problems 1, 2, 3	9
ECN 4250	ECN 4251	Statistics 1, 2	6
HST 4101		The Civilization of the Ancient and Medieval Worlds	3

One History course from the following:

(HST 4102, 4103, 4201, 4202, 4203, 4600 through 4646) 3

PHL 4100 Philosophical Thinking 3

PSY 4110 Introduction to Psychology:
Fundamental Issues 3

One Psychology elective (PSY) 3

SOC 4100 Roles, Culture, and the Individual 3

SOC 4101 Inequality and Institutions 3

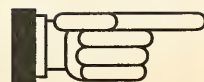
or or

SOC 4102 Institutions and Social Change 3

CMN 4101 Fundamentals of Human
Communication 3

Business Administration

ACC 4101	ACC 4102	ACC 4103	Accounting Principles 1, 2, 3	9
BL 4101	BL 4102		Law 1, 2	6
FI 4301			Principles of Finance	3
FI 4302			Financial Management	3
HRM 4301	HRM 4302		Organizational Behavior 1, 2	6
MGT 4101	MGT 4102		Introduction to Business and Management 1, 2	6
MGT 4446			International Business Management and Operations	3
MIS 4114			Introduction to PC Software	3
MIS 4115			Introduction to Computers and Information Systems	3



MIS 4236	Advanced PC Software	3
MKT 4301	Introduction to Marketing 1	3
OM 4404	Service Operations Management	3
MGT 4450* MGT 4451	Business Policy 1, 2	6

Major Concentration Courses

ACC 4301	ACC 4302	ACC 4307	Intermediate Accounting 1, 2, 3	9
ACC 4408			Intermediate Accounting 4	3
ACC 4310			Cost Accounting 1	3
ACC 4411			Cost Accounting 2	3
ACC 4425	ACC 4426		Auditing 1, 2	6
ACC 4440	ACC 4441		Federal Income Taxes 1, 2	6
ACC 4400			Accounting Information Systems	3

Electives

Natural science elective (BIO, CHM, or ESC)	3
Open electives	17
Business elective	3

Total Quarter Hours

174

*Students must complete 130 q.h. and all other Business Administration core courses before enrolling in Business Policy 1.

Suggested: ENG 4384 *Workshop in Case Study Analysis* before taking MGT 4450 and other upper-level reserved courses that require writing about cases.

Finance Bachelor of Science in Business Administration Degree (Major Code 433)



See also: Finance Associate in Science Degree, page 81.

Liberal Arts

			quarter hours
ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
MTH 4110	MTH 4111	Contemporary Algebra 1, 2	6
ECN 4115	ECN 4116	Economic Principles and Problems 1, 2, 3	9
ECN 4250	ECN 4251	Statistics 1, 2	6
PSY 4110		Introduction to Psychology: Fundamental Issues	3
One Psychology elective (PSY)			3
ENG 4380	ENG 4381	Writing for the Professions 1, 2	6
SOC 4100		Roles, Culture, and the Individual	3
SOC 4101		Inequality and Institutions	(3)
or		or	
SOC 4102		Institutions and Social Change	(3)
CMN 4101		Fundamentals of Human Communication	3
HST 4101		The Civilization of the Ancient and Medieval Worlds	3
One History course from the following:			
(HST 4102, 4103, 4201, 4202, 4203, 4600 through 4646)			3
PHL 4100		Philosophical Thinking	3

Business Administration

ACC 4101	ACC 4102	ACC 4103	Accounting Principles 1, 2, 3	9
BL 4101	BL 4102		Law 1, 2	6
HRM 4301	HRM 4302		Organizational Behavior 1, 2	6
MGT 4101	MGT 4102		Introduction to Business and Management 1, 2	6
MGT 4446			International Business Management and Operations	3
MIS 4114			Introduction to PC Software	3
MIS 4115			Introduction to Computers and Information Systems	3
MIS 4236			Advanced PC Software	3
MKT 4301			Introduction to Marketing 1	3
OM 4404			Service Operations Management	3
MGT 4450*	MGT 4451		Business Policy 1, 2	6

*Students must complete 130 q.h. and all other Business Administration core courses before enrolling in Business Policy 1.

Suggested: ENG 4384 *Workshop in Case Study Analysis* before taking MGT 4450 and other upper-level reserved courses that require writing about cases.



Major Concentration Courses

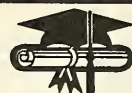
FI 4301	Principles of Finance	3
FI 4302	Financial Management	3
FI 4403	Financial Strategy	3
FI 4310	Investment Principles	3
FI 4411	Investment Management	3
FI 4320	Credit Principles	3
FI 4421	Credit Management	3
FI 4325	Budgeting and Planning	3
FI 4426	Financial Control	3
FI 4450	International Finance	3

Electives

Natural science elective (BIO, CHM, or ESC)	3
Open electives	26
Business elective	3

Total Quarter Hours 174

Management Bachelor of Science in Business Administration Degree (Major Code 463)



See also: Business Administration Associate in Science Degree, page 80.

Liberal Arts

			quarter hours
ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
MTH 4110	MTH 4111	Contemporary Algebra 1, 2	6
ENG 4380	ENG 4381	Writing for the Professions 1, 2	6
ECN 4115	ECN 4116	Economic Principles and Problems 1, 2, 3	9
ECN 4250	ECN 4251	Statistics 1, 2	6
HST 4101		The Civilization of the Ancient and Medieval Worlds	3
One History course from the following:			
(HST 4102, 4103, 4201, 4202, 4203, 4600 through 4646)			3
PHL 4100		Philosophical Thinking	3
PSY 4110		Introduction to Psychology: Fundamental Issues	3
One Psychology elective (PSY)			3
SOC 4100		Roles, Culture, and the Individual	3
SOC 4101		Inequality and Institutions	(3)
or		or	
SOC 4102		Institutions and Social Change	(3)
CMN 4101		Fundamentals of Human Communication	3

Business Administration

ACC 4101	ACC 4102	ACC 4103	Accounting Principles 1, 2, 3	9
BL 4101	BL 4102		Law 1, 2	6
FI 4301			Principles of Finance	3
FI 4302			Financial Management	3
HRM 4301	HRM 4302		Organizational Behavior 1, 2	6
HRM 4310			Human Resources Management	3
MGT 4101	MGT 4102	MGT 4103	Introduction to Business and Management 1, 2, 3	9
MIS 4114			Introduction to PC Software	3
MIS 4115			Introduction to Computers and Information Systems	3
MIS 4236			Advanced PC Software	3
MKT 4301			Introduction to Marketing 1	3
OM 4404			Service Operations Management	3



Major Concentration Courses

HRM 4415	Leadership	3
MGT 4410	Project Management Process:	
	Planning and Implementation	3
MGT 4446	International Business	
	Management and Operations	3
MGT 4455	Manager and Society	3
MKT 4320	Marketing Management 1	3
MIS 4446	Information Systems for Management	3
MGT 4450* MGT 4451	Business Policy 1, 2	6

Electives

Natural science elective (BIO, CHM, or ESC)	3
Open electives	26
Business electives	6

Total Quarter Hours 174

*Students must complete 130 q.h. and all other Business Administration core courses before enrolling in Business Policy 1.

Suggested: ENG 4384 *Workshop in Case Study Analysis* before taking MGT 4450 and other upper-level reserved courses that require writing about cases.

ACCEL

Fast-track for the Management BSBA, the Management Information Systems (MIS) BSBA, and Liberal Arts with a Business Minor

ACCEL, the premier accelerated management program for adults in the Boston region, will enable students to speed up the study of their Management BSBA, MIS BSBA or Liberal Arts with Business Minor. If you have relevant transfer credit or take College Level Examination Program (CLEP) examinations in certain subjects, you can finish even faster.

The *ACCEL* program is very flexible. You can start the program at any point. This way, if you have completed an associate's degree program, have other transfer credit or can take CLEP examinations for certain subjects, you will have a head start, or a lighter course load in an academic quarter.

The program is offered on the Boston and Burlington campuses on Friday nights and Saturday mornings with the exception of the summer quarter when the schedule reverts to the Monday through Thursday evening format. Many of the courses in the program are offered at a reduced tuition rate.

Please call 617-373-2400 or TTY 617-373-2825 to request a brochure explaining the *ACCEL* program.

Management Information Systems Bachelor of Science in Business Administration Degree (Major Code 465)



See also: Management Information Systems Associate in Science Degree, page 84.

Liberal Arts

			quarter hours
ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
MTH 4110	MTH 4111	Contemporary Algebra 1, 2	6
ENG 4380	ENG 4381	Writing for the Professions 1, 2	6
ECN 4115	ECN 4116	Economic Principles and Problems 1, 2, 3	9
ECN 4250	ECN 4251	Statistics 1, 2	6
HST 4101		The Civilization of the Ancient and Medieval Worlds	3

One History course from the following:

(HST 4102, 4103, 4201, 4202, 4203, 4600 through 4646)			3
PHL 4100		Philosophical Thinking	3
PSY 4110		Introduction to Psychology: Fundamental Issues	3

One Psychology elective (PSY)

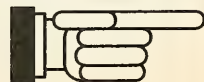
SOC 4100		Roles, Culture, and the Individual	3
SOC 4101		Inequality and Institutions	(3)
or		or	
SOC 4102		Institutions and Social Change	(3)
CMN 4101		Fundamentals of Human Communication	3

Business Administration

ACC 4101	ACC 4102	ACC 4103	Accounting Principles 1, 2, 3	9
BL 4101	BL 4102		Law 1, 2	6
FI 4301			Principles of Finance	3
FI 4302			Financial Management	3
HRM 4301	HRM 4302		Organizational Behavior 1, 2	6
MGT 4101	MGT 4102		Introduction to Business and Management 1, 2	6
MGT 4446			International Business Management and Operations	3
MIS 4114			Introduction to PC Software	3
MIS 4115			Introduction to Computers and Information Systems	3
MIS 4236			Advanced PC Software	3
MIS 4221	MIS 4222		COBOL Programming 1, 2	(6)
or			or	
MIS 4276	MIS 4277		C Programming 1, 2	(6)
MIS 4282			Operating Systems Overview	(3)
or			or	
MIS 4273			PC DOS	(3)
MKT 4301			Introduction to Marketing 1	3
OM 4404			Service Operations Management	3
MGT 4450*	MGT 4451		Business Policy 1, 2	6

*Students must complete 130 q.h. and all other Business Administration core courses before enrolling in Business Policy 1.

Suggested: ENG 4384 *Workshop in Case Study Analysis* before taking MGT 4450 and other upper-level reserved courses that require writing about cases.



Major Concentration Courses

MGT 4410		Project Management Process: Planning and Implementation	3
MIS 4301	MIS 4302	Structured Systems Analysis and Design 1, 2	6
MIS 4307		Communications and Networking	3
MIS 4445		Database Management Systems	3
MIS 4446		Information Systems for Management	3
MIS 4485		Applied MIS Development Project	3

Electives*

Natural science elective (BIO, CHM, or ESC)	3
Open electives	20
Business elective	3

Total Quarter Hours**174**

*Telecommunications, Communications and Unix Programming Certificate Electives:

Your choice of one of the following Center for Continuing Education non-credit certificates will be accepted into the Management Information Systems AS and BSBA and the Operations Management AS and Operations Technology BS:

Communications Systems
Data Communications Systems
Telecommunications Systems
Unix Programming non-credit

Each certificate is equivalent to 18 q.h. of credit and is considered nonbusiness. Contact the Office of Academic and Student Affairs at 617-373-2400 or TTY 617-373-2825 to discuss how to petition.

ACCEL

Fast-track for the Management BSBA, the Management Information Systems (MIS) BSBA, and Liberal Arts with a Business Minor

ACCEL, the premier accelerated management program for adults in the Boston region, will enable students to speed up the study of their Management BSBA, MIS BSBA or Liberal Arts with Business Minor. If you have relevant transfer credit or take College Level Examination Program (CLEP) examinations in certain subjects, you can finish even faster.

The *ACCEL* program is very flexible. You can start the program at any point. This way, if you have completed an associate's degree program, have other transfer credit or can take CLEP examinations for certain subjects, you will have a head start, or a lighter course load in an academic quarter.

The program is offered on the Boston and Burlington campuses on Friday nights and Saturday mornings with the exception of the summer quarter when the schedule reverts to the Monday through Thursday evening format. Many of the courses in the program are offered at a reduced tuition rate.

Please call 617-373-2400 or TTY 617-373-2825 to request a brochure explaining the *ACCEL* program.

Marketing Bachelor of Science in Business Administration Degree (Major Code 461)



See also: Marketing Associate in Science degree, page 85.

Liberal Arts

				quarter hours
ENG 4100			Critical Writing 1	4
ENG 4111	ENG 4112		Critical Writing 2, 3	6
MTH 4110	MTH 4111		Contemporary Algebra 1, 2	6
ENG 4380	ENG 4381		Writing for the Professions 1, 2	6
ECN 4115	ECN 4116	ECN 4117	Economic Principles and Problems 1, 2, 3	9
ECN 4250	ECN 4251		Statistics 1, 2	6
HST 4101			The Civilization of the Ancient and Medieval Worlds	3

One History course from the following:

(HST 4102, 4103, 4201, 4202, 4203, 4600 through 4646)

PHL 4100 Philosophical Thinking 3

PSY 4110 Introduction to Psychology: Fundamental Issues 3

One Psychology elective (PSY) 3

SOC 4100 Roles, Culture, and the Individual 3

SOC 4101 Inequality and Institutions (3)

or or

SOC 4102 Institutions and Social Change (3)

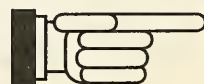
CMN 4101 Fundamentals of Human Communication 3

Business Administration

ACC 4101	ACC 4102	ACC 4103	Accounting Principles 1, 2, 3	9
BL 4101	BL 4102		Law 1, 2	6
FI 4301			Principles of Finance	3
FI 4302			Financial Management	3
HRM 4301	HRM 4302		Organizational Behavior 1, 2	6
MGT 4101	MGT 4102		Introduction to Business and Management 1, 2	6
MGT 4446			International Business Management and Operations	3
MIS 4114			Introduction to PC Software	3
MIS 4115			Introduction to Computers and Information Systems	3
MIS 4236			Advanced PC Software	3
OM 4404			Service Operations Management	3
MGT 4450*	MGT 4451		Business Policy 1, 2	6

*Students must complete 130 q.h. and all other Business Administration core courses before enrolling in Business Policy 1.

Suggested: ENG 4384 *Workshop in Case Study Analysis* before taking MGT 4450 and other upper-level reserved courses that require writing about cases.



Major Concentration Courses

MKT 4301	Introduction to Marketing 1	3
MKT 4302	Introduction to Marketing 2	3
MKT 4310	Advertising Management 1	3
MKT 4411	Advertising Management 2	3
MKT 4315	Professional Selling Skills	3
MKT 4416	Strategic Sales Management	3
MKT 4320	Marketing Management	3
MKT 4430	Marketing Research 1	3
MKT 4431	Marketing Research 2	3
MKT 4453	International Marketing	3
MKT 4457	Competitive Strategy	3

Electives

Natural science elective (BIO, CHM, or ESC)	3
Open electives	20
Business elective	3

Total Quarter Hours	174
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Operations Technology Bachelor of Science Degree (BS)

A Bachelor of Science degree is offered in Operations Technology. The technology program is designed to prepare the student to meet the challenge of interfacing technology and society. The technology student not only learns related disciplines but also becomes oriented in disciplines to which his or her technological skills will be applied.

Graduates of science, engineering technology, liberal arts, or other selected programs in Northeastern University, community colleges, or other similar colleges and institutions who have an associate's degree or its equivalent may transfer applicable credits toward the degree requirements of the baccalaureate program in operations technology. **No more than 44 quarter hours of business administration credits may be applied toward the bachelor's degree in Operations Technology.**

Operations Technology Bachelor of Science Degree (Major Code 492)



Liberal Arts

	quarter hours
ENG 4100	4
ENG 4111 ENG 4112	6
ECN 4115 ECN 4116 ECN 4117	9
ECN 4250 ECN 4251	6
MTH 4110 MTH 4111	6
PSY 4110	3
One Psychology elective (PSY)	3
SOC 4100	3
SOC 4101	(3)
or	or
SOC 4102	(3)

Business Administration

ACC 4101 ACC 4102	6
BL 4101 BL 4102	6
HRM 4301	3
MGT 4101	3
MIS 4114	3
MIS 4115	3
OM 4325* (formerly MS 4325)	3

*Not a prerequisite for OM 4404.



Major Concentration Courses

OM 4404**	Service Operations Management	(3)
or	or	
OM 4301	Introduction to Operations Management	(3)
OM 4314	Productivity Enhancement and Quality	3
OM 4351 (formerly PUR 4351)	Introduction to Purchasing	3
OM 4321	Operations Planning and Control	3
OM 4396 (formerly PUR 4396)	Systems and Technologies	3
TRN 4302	Introduction to Logistics	3

Nonbusiness electives (such as Science, Engineering Technology, Liberal Arts, or Criminal Justice)† 86

Total Quarter Hours 174

**Prerequisite: 80 q.h. of credit.

†Telecommunication, Communications and Unix Programming Certificate Electives:

Your choice of one of the following Center for Continuing Education non-credit certificates will be accepted into the Management Information Systems AS and BSBA and the Operations Management AS and Operations Technology BS:

- Communication Systems
- Data Communications Systems
- Telecommunications Systems
- UNIX Programming non-credit

Each certificate is equivalent to 18 q.h. of credit and is considered nonbusiness. Contact the Office of Academic and Student Affairs to discuss petition: 617-373-2400 or TTY 617-373-2825.

Criminal Justice and Security Degree Programs

Rose A. Doherty, *Assistant Dean,
Director, Criminal Justice and Security Programs*
266 Ryder Hall, 617-373-2423
617-373-2825 (TTY)

Nancy Bandoian,
*Assistant to the Director,
Criminal Justice and Security
Programs*

Program Consultant

Harvey Burstein, J.D.
Professor
College of Criminal Justice
617-373-2423

Purpose

Criminal Justice and Security programs are designed to provide a professional focus to students with a broadly based undergraduate education, to ensure that program graduates are prepared to enter or advance in careers in criminal justice or security administration or to enroll in graduate or professional schools.

The curriculum is built around a core of required courses after which the student selects a professional concentration. A choice of upper-level coursework is offered.

Certificate Programs

Students who seek specialized background in criminal law may choose a certificate program in Legal Studies, which may be taken independently or in conjunction with degree study. The certificate in Computer Crime and Security is another option for those studying for a criminal justice or business degree or those who are practicing criminal justice professionals. Students learn how information technology security programs are developed and how to coordinate these programs with auditors, legal departments, law enforcement officials, and other agencies.

Associate in Science Degree Program

An associate in science degree program in Criminal Justice is offered for those who wish to obtain a general background in corrections, policing, and security and who may later wish to pursue a bachelor's degree.

Candidates for the associate in science degree must complete a minimum of eighty-seven quarter hours of credit. This is one half of the requirements for the bachelor of science degree.

Bachelor of Science Degree Programs

The bachelor of science degree is offered with specializations in corrections, policing, and security. Students should choose their specialization in consultation with a program advisor. Each curriculum provides for not less than 174 quarter hours of work.

Criminal Justice Associate in Science Degree (Major Code 951)



Core Courses

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
HST 4203	American History Since 1917 3
MIS 4114	Introduction to PC Software 3
POL 4104	Introduction to American Government 3
PSY 4110	Introduction to Psychology: Fundamental Issues 3
SOC 4100	Roles, Culture, and the Individual 3
SOC 4186	Social Control 3

Criminal Justice Core

CJ 4101	Administration of Criminal Justice	3
CJ 4103 CJ 4104	Criminology 1, 2	6
CJ 4108 CJ 4109	Criminal Law and Procedure 1, 2	6
CJ 4110	Constitutional Law	3
CJ 4114 CJ 4115	Introduction to Law 1, 2	6
CJ 4201	Criminal Investigation 1	3
CJ 4301	American Correctional System	3
CJ 4403	Introduction to Security	3

Criminal justice and security electives 9

Open electives 17

HST 4563 History of Criminal Justice in America is recommended

Total Quarter Hours

87

Corrections Bachelor of Science Degree (Major Code 948)



Core Courses

				quarter hours
ENG 4100			Critical Writing 1	4
ENG 4111	ENG 4112		Critical Writing 2, 3	6
ECN 4115	ECN 4116	ECN 4117	Economic Principles and Problems 1, 2, 3	9
HST 4101			The Civilization of the Ancient and Medieval Worlds	3
HST 4102			The Civilization of the Early Modern World	(3)
or			or	
HST 4103			The Civilization of the Modern World	(3)
HST 4203			American History Since 1917	3
MIS 4114			Introduction to PC Software	3
PHL 4100			Philosophical Thinking	(3)
or			or	
PHL 4200			Logic	(3)
POL 4103			Introduction to Politics	3
POL 4104			Introduction to American Government	3
PSY 4110			Introduction to Psychology: Fundamental Issues	3
PSY 4111			Introduction to Psychology: Developmental Aspects	(3)
or			or	
PSY 4112			Introduction to Psychology: Personal Dynamics	(3)
SOC 4100			Roles, Culture and the Individual	3
SOC 4101			Inequality and Institutions	(3)
or			or	
SOC 4102			Institutions and Social Change	(3)
SOC 4186			Social Control	3
SOC 4320			Statistics *	3
SOC 4331			Research Methods 1	3
Mathematics/science courses (MTH 4110 or higher level)				6
CJ 4101			Administration of Criminal Justice	3
CJ 4103	CJ 4104		Criminology 1, 2	6
CJ 4108	CJ 4109		Criminal Law and Procedure 1, 2	6
CJ 4110			Constitutional Law	3
CJ 4114	CJ 4115		Introduction to Law 1, 2	6

Major Concentration Courses

CJ 4301		American Correctional System	3
CJ 4302	CJ 4303	Correctional Administration 1, 2	6
CJ 4304		Jail Administration and Management	3
CJ 4311		Probation and Parole	3
CJ 4310		Community Corrections	3

Electives

Criminal justice and security electives	24
Open electives	41

Total Quarter Hours

174

*Students who anticipate using quantitative methods are advised to take the full Research Methods Sequence: SOC 4320, SOC 4331, and SOC 4333.

Policing Bachelor of Science Degree (Major Code 946)



Core Courses

				quarter hours
ENG 4100			Critical Writing 1	4
ENG 4111	ENG 4112		Critical Writing 2, 3	6
ECN 4115	ECN 4116	ECN 4117	Economic Principles and Problems 1, 2, 3	9
HST 4101			The Civilization of the Ancient and Medieval Worlds	3
HST 4102			The Civilization of the Early Modern World	(3)
or			or	
HST 4103			The Civilization of the Modern World	(3)
HST 4203			American History Since 1917	3
MIS 4114			Introduction to PC Software	3
PHL 4100			Philosophical Thinking	(3)
or			or	
PHL 4200			Logic	(3)
POL 4103			Introduction to Politics	3
POL 4104			Introduction to American Government	3
PSY 4110			Introduction to Psychology: Fundamental Issues	3
PSY 4111			Introduction to Psychology: Developmental Aspects	(3)
or			or	
PSY 4112			Introduction to Psychology: Personal Dynamics	(3)
SOC 4100			Roles, Culture, and the Individual	3
SOC 4101			Inequality and Institutions	(3)
or			or	
SOC 4102			Institutions and Social Change	(3)
SOC 4186			Social Control	3
SOC 4320			Statistics*	3
SOC 4331			Research Methods 1	3
Mathematics/science courses (MTH 4110 or higher level)				6
CJ 4101			Administration of Criminal Justice	3
CJ 4103	CJ 4104		Criminology 1, 2	6
CJ 4108	CJ 4109		Criminal Law and Procedure 1, 2	6
CJ 4110			Constitutional Law	3
CJ 4114	CJ 4115		Introduction to Law 1, 2	6

Major Concentration Courses

CJ 4201	CJ 4202	Criminal Investigation 1, 2	6
CJ 4207		Comparative Police Systems	3
CJ 4209	CJ 4210	Police Management 1, 2	6
CJ 4214		Police and Society	3

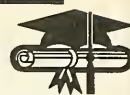
Electives

Criminal justice and security electives	24
Open electives	41

Total Quarter Hours

174

*Students who anticipate using quantitative methods are advised to take the full Research Methods Sequence: SOC 4320, SOC 4331, and SOC 4333.

Security Bachelor of Science Degree (Major Code 942)**Core Courses**

quarter hours

ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
ECN 4115	ECN 4116	Economic Principles and Problems 1, 2, 3	9
	ECN 4117		
HST 4101		The Civilization of the Ancient and Medieval Worlds	3
HST 4102		The Civilization of the Modern World	(3)
or		or	
HST 4103		The Civilization of the Modern World	(3)
HST 4203		American History Since 1917	3
MIS 4114		Introduction to PC Software	3
PHL 4100		Philosophical Thinking	(3)
or		or	
PHL 4200		Logic	(3)
POL 4103		Introduction to Politics	3
POL 4104		Introduction to American Government	3
PSY 4110		Introduction to Psychology: Fundamental Issues	3
PSY 4111		Introduction to Psychology: Developmental Aspects	(3)
or		or	
PSY 4112		Introduction to Psychology: Personal Dynamics	(3)
SOC 4100		Roles, Culture, and the Individual	3
SOC 4101		Inequality and Institutions	(3)
or		or	
SOC 4102		Institutions and Social Change	(3)
SOC 4186		Social Control	3
SOC 4320		Statistics*	3
SOC 4331		Research Methods 1	3
Mathematics/science courses (MTH 4110 or higher level)			6
CJ 4101		Administration of Criminal Justice	3
CJ 4103	CJ 4104	Criminology 1, 2	6
CJ 4108	CJ 4109	Criminal Law and Procedure 1, 2	6
CJ 4110		Constitutional Law	3
CJ 4114	CJ 4115	Introduction to Law 1, 2	6

Major Concentration Courses

CJ 4403		Introduction to Security	3
CJ 4406	CJ 4407	Security Administration 1, 2	6
CJ 4408		Legal Aspects of Security Management and Operations	3
CJ 4411		Electronic Information Security	3
CJ 4412		Computer Crime and Security	3

Electives

Criminal justice and security electives	24
Open electives	41

Total Quarter Hours**174**

*Students who anticipate using quantitative methods are advised to take the full Research Methods Sequence: SOC 4320, SOC 4331, and SOC 4333.

Health Professions and Sciences Degree Programs

Shirley M. Russo, Ph.D.
Assistant Dean and Director,
Health Professions and Sciences Programs

266 Ryder Hall
617-373-5796, 617-373-2825 (TTY)

Program Directors and Coordinators

Area program directors and the Director of Health Professions and Sciences Programs have overall responsibility for the academic quality of the health programs in their areas of specialty. *The program coordinators for each area serve as the chief academic advisors for students in their programs.*

Health Professions

EMS: Paramedic Technology

Program Director: David Rayne
(University College) (617-238-8400)

HIA: Health Information Administration

Program Director: Annalee Collins, M.Ed.
(University College) (617-373-2525)

HMG: Health Management

Consultant: Joseph McNabb, M.A.
(Labouré College) (617-296-8300, ext. 4022)

HSC: Health Science

Consultant: Nancy Warner, M.S.
(Bouvé College of Pharmacy
and Health Sciences) (617-373-3320)

MLS: Medical Laboratory Science

Program Director: Barbara Martin, M.P.H.
(Bouvé College of Pharmacy and Health
Sciences)
(617-373-3664)

NUR: Nursing

Consultant: Anne Bateman, Ph.D.
(College of Nursing) (617-373-3627)

RAD: Radiologic Technology

Director: Valerie Lamb, R.T.R., B.S.
(University College) (617-373-2818)
Assistant Director: Maryanne Atkinson,
B.S.N., R.T.R. (University College)
(617-373-2818)

Sciences

BIO: Biology

Consultant: Fred A. Rosenberg, Ph.D.
(College of Arts and Sciences) (617-373-4042)
Biology Coordinator: Adrian Gilbert, M.S.
Laboratory Coordinator:
Kevin Mautte, M.S. (Biology Department)
(617-373-2260)

Biotechnology

Consultant: John Monahan, Ph.D.
(CIBA Corning Diagnostics)
(508-660-2066, between 7:00-9:00 p.m.)

CHM: Chemistry

Consultant: William M. Reiff, Ph.D. (College of
Arts and Sciences) (617-373-2381)
Assistant Coordinator: Jean Cathron (College of
Arts and Sciences) (617-373-2824)

ESC: Earth Science

Consultant: Bruce Mellin, M.S.
(Brooks School)
(508-686-6101, ext. 3352)

MTH: Mathematics

Consultant: Francis X. Finigan, M.Ed.
(Educational Consultant)
(617-484-8496)

Purpose

University College offers part-time and full-time programs in allied health and science to prepare students for advancement and service in hospitals, health agencies, research facilities, environmental and biotechnology industries.

The associate's and bachelor's degree programs are designed to provide both professional specialization and general education. Programs meet the standards of the appropriate accrediting body and/or of licensing or registration boards, where such exist.

Clinical Assignments

Clinical assignments are generally available for students whose programs require applied study in a clinical setting. Clinical practice is conducted at hospitals or other health agencies in the Greater Boston area. Positions in applied clinical studies are often offered on a first-come, first-served basis. Arrangements should be made with the program's clinical coordinator as much in advance as possible.

Most clinicals require liability insurance and a health clearance. Students should check with the clinical coordinator of the program for exact details.

Students who accept clinical assignments in health facilities are expected to adhere to the requirements of the facilities, which are outside University control.

Special Studies

University College offers a variety of Special Studies. These courses give students an opportunity to earn credits in Advanced Tutorials, Independent Studies, Honors Programs, and Field Work. Consult descriptions on pages 24-25. **Students should be aware that special criteria exist for certain courses; therefore, the course description should be consulted.**

Certificates and Special Programs

University College offers a variety of certificates as well as special programs for certification preparation and graduate school preparation. Students can choose a certificate program to learn new skills or enhance skills they already have. If the student wishes to continue, many certificates are transferable into related degree programs. University College Health Professions and Sciences courses often serve as gateways to the most desirable graduate schools, such as: schools of medicine, osteopathy, dentistry, podiatry, or optometry. In addition, some of these courses serve as background preparation for graduate and undergraduate programs in physical therapy; speech-language pathology and audiology; and dental hygiene. **Please note:** taking these courses does not guarantee acceptance into specific graduate schools. Health and Science certificates and special programs are listed below:

Advanced Environmental Sciences	(page 56)
Dental Hygiene Preparation	(page 63)
Emergency Medical Technician/Basic	(page 58)
Environmental Studies	(page 46)
Health Information Administration Post-Baccalaureate	(page 114)
Medical/Dental School Preparation	(page 64)
Paramedic Technology	(page 123)
Phlebotomy Certification Preparation	(page 59)
Physical Therapy Preparation	(page 65)
Speech-Language Pathology and Audiology	
Pre-Professional Preparation	(page 65)
Teacher Preparation in Health Education	(page 62)

Bachelor's Degree in Biological Science offers Professional Opportunities

In offering this baccalaureate degree program in Biological Science, University College recognizes the critical role that a traditional biology major can play in preparing students for several distinguished professions. The program provides both a broad spectrum of biology courses and a firm foundation in the liberal arts and sciences. The balanced and comprehensive curriculum gives the students the background valued by medical, dental and veterinary schools. It would also be useful to those who desire to prepare for careers teaching science in secondary schools.

Biological Science Bachelor of Science Degree (Major Code 818)



Core Courses

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
MTH 4110 MTH 4111 MTH 4112	Contemporary Algebra 1, 2, 3 9
PSY or SOC electives	Psychology or Sociology 9
COM 4101	Foundations of Computer Literacy 4
LN or MIS	Modern Language or Computer Language 8 or 9
Economics (ECN) Courses of your choice	9
History (HST) Courses of your choice	9

Major Concentration Courses

BIO 4107/BIO 4110	Biology 1/Lab for Biology 1	3/1
BIO 4108/BIO 4111	Biology 2/Lab for Biology 2	3/1
BIO 4109/BIO 4112	Biology 3/Lab for Biology 3	3/1
BIO 4161/BIO 4165	Human Anatomy and Physiology 1/Lab for Human Anatomy and Physiology 1	3/1
BIO 4162/BIO 4166	Human Anatomy and Physiology 2/Lab for Human Anatomy and Physiology 2	3/1
BIO 4207/BIO 4210	Microbiology 1/Lab for Microbiology 1	2/1
BIO 4208/BIO 4211	Microbiology 2/Lab for Microbiology 2	2/1
BIO 4224 BIO 4225	Ecology 1, 2	6
BIO 4235 BIO 4236	Genetics 1, 2	6
BIO 4237	Genetics Laboratory	2
BIO 4246 BIO 4247	Cell Biology 1, 2	6
BIO 4248	Cell Biology Laboratory	2



CHM 4133/CHM 4140	Chemical Principles 1/Lab for Chemical Principles 1	3/1
CHM 4134/CHM 4141	Chemical Principles 2/Lab for Chemical Principles 2	3/1
CHM 4135/CHM 4142	Chemical Principles 3/Lab for Chemical Principles 3	3/1

CHM 4233/CHM 4237	Analytical Chemistry*/Lab for Analytical Chemistry*	4/1
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CHM 4251/CHM 4254	Organic Chemistry 1/Lab for Organic Chemistry 1	3/1
CHM 4252/CHM 4255	Organic Chemistry 2/Lab for Organic Chemistry 2	3/1

MTH 4130 MTH 4131	Fundamentals of Calculus 1, 2	6
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MTH 4132	Fundamentals of Calculus 3	(3)
or	or	
ECN 4250	Statistics 1	(3)

PHY 4117/PHY 4196	Physics 1/Lab for Physics 1	4/1
PHY 4118/PHY 4197	Physics 2/Lab for Physics 2	4/1
PHY 4119/PHY 4198	Physics 3/Lab for Physics 3	4/1

Biological Science electives (*Choose 15 q.h. of any BIO courses except BIO 4215/4217 and BIO 4216/4218. Registration restricted to paramedic students.*)

Electives as needed to complete credits

Total Quarter Hours 174

*Summer Quarter only.

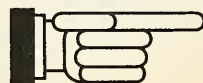
Biotechnology

Associate in Science Degree

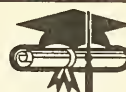
The associate in science degree program in Biotechnology helps provide a strong science foundation required for entry level employment opportunities in biotechnology. Positions can be found both in the laboratory and in manufacturing. Employment opportunities exist in biomedical and clinical labs as well as in the biotechnology industry.

Bachelor of Science Degree

The bachelor of science degree program in Biotechnology integrates theoretical and laboratory courses from the fields of biology and chemistry. The program is designed to help prepare students for careers in the biotechnology industry or other related fields. Employment opportunities may be found in biotechnology, biomedical, pharmaceutical, veterinary or agricultural laboratories.



Biotechnology Associate in Science Degree (Major Code 812)



Core Courses

ENG 4100	Critical Writing 1	4
ENG 4111 ENG 4112	Critical Writing 2, 3	6
MTH 4110 MTH 4111 MTH 4112	Contemporary Algebra 1, 2, 3	9

Major Concentration Courses

BIO 4107/BIO 4110	Biology 1/Lab for Biology 1	3/1
BIO 4108/BIO 4111	Biology 2/Lab for Biology 2	3/1
BIO 4109/BIO 4112	Biology 3/Lab for Biology 3	3/1

BIO 4207/BIO 4210	Microbiology 1/Lab for Microbiology 1	2/1
BIO 4208/BIO 4211	Microbiology 2/Lab for Microbiology 2	2/1
BIO 4209/BIO 4212	Microbiology 3/Lab for Microbiology 3	2/1

BIO 4455	Introduction to Biotechnology	3
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CHM 4133/CHM 4140	Chemical Principles 1/Lab for Chemical Principles 1	3/1
CHM 4134/CHM 4141	Chemical Principles 2/Lab for Chemical Principles 2	3/1
CHM 4135/CHM 4142	Chemical Principles 3/Lab for Chemical Principles 3	3/1

CHM 4251/CHM 4254	Organic Chemistry 1/Lab for Organic Chemistry 1	3/1
CHM 4252/CHM 4255	Organic Chemistry 2/Lab for Organic Chemistry 2	3/1
CHM 4253/CHM 4256	Organic Chemistry 3/Lab for Organic Chemistry 3	3/1

or

or

CHM 4230/CHM 4234	Analytical Chemistry 1/Lab for Analytical Chemistry 1	2/1
CHM 4231/CHM 4235	Analytical Chemistry 2/Lab for Analytical Chemistry 2	2/1
CHM 4232/CHM 4236	Analytical Chemistry 3/Lab for Analytical Chemistry 3	2/1

PHY 4101 PHY 4102	College Physics 1, 2	8
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Electives

Liberal Arts; Chemistry, Biology, or Calculus as needed to complete total credits

Total Quarter Hours

87

Biotechnology Bachelor of Science Degree (Major Code 813)



Core Courses

	quarter hours
ENG 4100	4
ENG 4111 ENG 4112	6
MTH 4110 MTH 4111 MTH 4112	9
PHY 4101 PHY 4102	8
Critical Writing 1	
Critical Writing 2, 3	
Contemporary Algebra 1, 2, 3	
College Physics 1, 2	
Liberal Arts courses of your choice	18

Major Concentration Courses

BIO 4107/BIO 4110	Biology 1/Lab for Biology 1	3/1
BIO 4108/BIO 4111	Biology 2/Lab for Biology 2	3/1
BIO 4109/BIO 4112	Biology 3/Lab for Biology 3	3/1

CHM 4133/CHM 4140	Chemical Principles 1/Lab for Chemical Principles 1	3/1
CHM 4134/CHM 4141	Chemical Principles 2/Lab for Chemical Principles 2	3/1
CHM 4135/CHM 4142	Chemical Principles 3/Lab for Chemical Principles 3	3/1

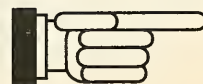
BIO 4207/BIO 4210	Microbiology 1/Lab for Microbiology 1	2/1
BIO 4208/BIO 4211	Microbiology 2/Lab for Microbiology 2	2/1
BIO 4209/BIO 4212	Microbiology 3/Lab for Microbiology 3	2/1

BIO 4235 BIO 4236 BIO 4237	Genetics 1, 2, and Lab	8
BIO 4246 BIO 4247 BIO 4248	Cell Biology 1, 2, and Lab	8

BIO 4387/BIO 4391	Histology 1/Lab for Histology 1	2/1
BIO 4388/BIO 4392	Histology 2/Lab for Histology 2	2/1
BIO 4389/BIO 4393	Histology 3/Lab for Histology 3	2/1

BIO 4455	Introduction to Biotechnology	3
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CHM 4230/CHM 4234	Analytical Chemistry 1/Lab for Analytical Chemistry 1	2/1
CHM 4231/CHM 4235	Analytical Chemistry 2/Lab for Analytical Chemistry 2	2/1
CHM 4232/CHM 4236	Analytical Chemistry 3/Lab for Analytical Chemistry 3	2/1



CHM 4251/CHM 4254	Organic Chemistry 1/Lab for Organic Chemistry 1	3/1
CHM 4252/CHM 4255	Organic Chemistry 2/Lab for Organic Chemistry 2	3/1
CHM 4253/CHM 4256	Organic Chemistry 3/Lab for Organic Chemistry 3	3/1

CHM 4321 CHM 4322 CHM 4323 Instrumental Analysis 1, 2, 3 9

CHM 4371	Biochemistry 1	3
CHM 4372	Biochemistry 2	3
CHM 4373	Biochemistry 3	3

Biotechnology electives

Choose 20 q.h. from the following:

BIO 4125	Biology of AIDS	(3)
BIO 4260	Cell, Tissue and Organ Culture	(3)
BIO 4300	Computer Applications in Science	(3)
BIO 4425	Endocrinology	(3)
BIO 4461	Immunology	(4)
BIO 4501	Development of New Virus Vaccines	(3)
BIO 4510	Introduction to Immunodiagnostics	(3)
BIO 4511	Introduction to Recombinant DNA	(3)
BIO 4512/BIO 4515	Biomolecular Separations/Lab for Biomolecular Separations	(3)/(1)
BIO 4603	Scanning Electron Microscope	(3)
BIO 4604	Transmission Electron Microscope	(3)
BIO 4605	Principles of Light Microscopy and Histotechniques	(3)

General Electives as needed to complete total credits

Total Quarter Hours **174**

Health Information Administration

The Health Information Administrator's varied responsibilities relate to information systems and include the organization, operation and management of health information services. Required skills for this profession include the ability to design health information and retrieval systems; develop, analyze and evaluate health records and indexes; work with medical and administrative staffs within health care facilities developing methods for evaluation of patient care; and conduct research projects using health information.

Health Information Administrators work in a variety of health care settings. About 75% are employed by hospitals and ambulatory care facilities as directors, assistant directors or supervisors of Health Information Departments. They are also employed by government agencies, insurance companies, law firms, and health information programs at colleges and universities. A growing number of Health Information Administrators work for computer companies that market health information software.

Students who successfully complete this program are eligible to take the national credential examination conducted by the American Health Information Management Association. Candidates who successfully complete this examination are known as Registered Record Administrators (RRA).

It is strongly urged that potential students schedule a personal interview with the HIA Program Director. Call 617-373-2525 to schedule an appointment.

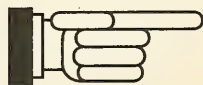
Professional Programs

The Health Information Program at University College offers a Bachelor's Degree Program and a Post-Baccalaureate Certificate Program. The program is accredited by the Commission on Accreditation of Allied Health Education (CAAHEP) in cooperation with the American Health Information Management Association's Council on Accreditation.

The Bachelor of Science Degree Program is designed for individuals who wish to obtain a degree in Health Information Administration. The Post-Baccalaureate Certificate Program is designed for those with a bachelor's degree in any area, who wish to redirect their careers. Previous college credits obtained at another accredited college or university may be transferred into either program using a Transfer Credit Petition Form obtained from University College's Office of Academic and Student Affairs.

Each program may be completed on a part-time or full-time basis. Although students may begin either program at any time of the year, there are established suggested patterns of courses that begin in either the Summer or Fall quarters of each year. Prior to beginning any of these patterns, Post-Baccalaureate Certificate students must have completed the prerequisite coursework in statistics, anatomy and physiology and computer literacy. Details concerning prerequisite courses may be obtained from the HIA Program Director.

Specific courses designated (*) in the curricula of both programs require a grade of C or better. Only one professional course may be repeated. Students who receive a grade of D in more than one professional course will be withdrawn from the program. A quality-point average of 2.5 is essential in order to enter any of the three clinical courses. Post-Baccalaureate Certificate students must complete their program of study with at least a QPA of 2.5 in order to receive a certificate from University College. Degree and certificate students who successfully complete their programs of study are eligible to take the national credential examination.



Health Information Administration Bachelor of Science Degree (Major Code 864)



Core Courses

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111	ENG 4112 Critical Writing 2, 3 6
MTH 4110	MTH 4111 Contemporary Algebra 1, 2 6

BIO 4107/BIO 4110	Biology 1/Lab for Biology 1	3/1
BIO 4108/BIO 4111	Biology 2/Lab for Biology 2	3/1
BIO 4109/BIO 4112	Biology 3/Lab for Biology 3	3/1

BIO 4161/BIO 4165	Human Anatomy and Physiology 1/Lab for Human Anatomy and Physiology 1	3/1
BIO 4162/BIO 4166	Human Anatomy and Physiology 2/Lab for Human Anatomy and Physiology 2	3/1
BIO 4163/BIO 4167	Human Anatomy and Physiology 3/Lab for Human Anatomy and Physiology 3	3/1

ECN 4115	ECN 4116	ECN 4117	Economic Principles and Problems 1, 2, 3	9
ECN 4250			Statistics 1	3

ECN 4251	Statistics 2	(3)
or	or	
HMG 4200	Health Science Statistics	(3)

Social Sciences courses of your choice (PSY, HST, SOC, POL) 24

Major Concentration Courses

COM 4101	Foundations of Computer Literacy++	4
HMG 4215	Health Law* ++	3
HMG 4301	Health Care Delivery Systems* ++	3
HMG 4400	Health Care Finance*	3
HMG 4411	Research for Managers*	3
HRM 4301	Organizational Behavior*	3
HRM 4310	Human Resource Management*	3
HSC 4301	HSC 4302 Pathophysiology 1, 2*	6

Professional Courses

HIA 4300	Medical Terminology*+	4
HIA 4315	HIA 4316 Health Information Administration 1, 2*	6
HIA 4328	HIA 4329 Nomenclature and Classification 1, 2*	6
HIA 4335	HIA 4336 HIA 4337 Clinical Practicum 1, 2, 3*∞	8
HIA 4400	Specialized Health Information Systems*	3
HIA 4415	Health Care Quality Management*	3
HIA 4330	HIA 4431 Health Information Management 1, 2*	6
HIA 4500	Health Information Computer Systems*	3
HIA 4520	Topics in Health Information Administration*	3
HIA 4530	Health Care Systems/Computerized Patient Record Systems*	3

General Electives as needed to complete total credits

Total Quarter Hours

174

*Students must obtain a grade of C or better in this course.

+A challenge examination is available for this course. Call 617-373-2525 for details.

++It is recommended that these courses be taken at the beginning of the student's course of study.

∞Liability insurance is required for these courses.

Health Information Administration Post-Baccalaureate Certificate (Major Code 868)



Prerequisite Coursework

1. One year of Anatomy and Physiology with Laboratory: grade of C or better.
Suggested courses: BIO 4175/BIO 4185, BIO 4176/BIO 4186, BIO 4177/BIO 4187
2. Introduction to Computers. Suggested course: COM 4101.
3. Descriptive Statistics. Suggested course: HMG 4200.

Core Courses

			quarter hours
HMG 4215		Health Law* ††	3
HMG 4301		Health Care Delivery Systems * ††	3
HMG 4400		Health Care Finance*	3
HMG 4411		Research for Managers*	3
HRM 4310		Human Resource Management*	3
HSC 4301	HSC 4302	Pathophysiology 1, 2*	6

Professional Courses

HIA 4300			Medical Terminology*†	4
HIA 4315	HIA 4316		Health Information Administration 1, 2*	6
HIA 4328	HIA 4329		Nomenclature and Classification 1, 2*	6
HIA 4335	HIA 4336	HIA 4337	Clinical Practicum 1, 2, 3*∞	8
HIA 4400			Specialized Health Information Systems*	3
HIA 4415			Health Care Quality Management*	3
HIA 4430	HIA 4431		Health Information Management 1, 2*	6
HIA 4500			Health Information Computer Systems*	3
HIA 4520			Topics in Health Information Administration*	3
HIA 4530			Health Care Systems/Computerized Patient Record Systems*	3

Total Quarter Hours

66

*Students must receive a C or better in this course.

†A challenge examination is available for this course. Call 617-373-2525 for details.

††It is recommended that these courses be taken at the beginning of the student's course of study.

∞Liability insurance is required for these courses.

Health Management

The health care industry is changing rapidly in response to increasing competition, rising costs, technological advances, the growth of alternative delivery systems, and an aging population.

University College's bachelor of science degree program in Health Management is intended for those who wish to prepare for entry into or advancement in managerial positions in the health care field.

The program combines professional competencies with a liberal arts education to help direct students toward either entry-level positions or positions of increasing responsibility in health services administration. The curriculum also provides a foundation for graduate studies in MBA and MHA programs.

Health Management Bachelor of Science Degree (Major Code 860)



Core Courses			quarter hours
ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
MTH 4110	MTH 4111	MTH 4112	9
ECN 4115	ECN 4116	ECN 4117	9
SOC 4100		Economic Principles and Problems 1, 2, 3	9
POL 4103		Roles, Culture, and the Individual	3
PSY 4110		Introduction to Politics	3
		Introduction to Psychology:	
		Fundamental Issues	3
COM 4101		Foundations of Computer Literacy	4
Basic Major Concentration Courses			
ACC 4101	ACC 4102	Accounting Principles 1, 2	6
FI 4301		Principles of Finance	3
FI 4302		Financial Management	3
HMG 4100	HMG 4101	Managing Health Services Organizations 1, 2*	6
HMG 4301		Health Care Delivery Systems*	3
Advanced Major Concentration Courses			
HIA 4415		Health Care Quality Management	3
HMG 4200		Health Science Statistics	3
HMG 4215		Health Law	3
HMG 4325		Health Planning and Regulation	3
HMG 4390		The Patient's Impact on Decision-Making	3
HMG 4400	HMG 4401	Health Care Financial Management 1, 2	6
HMG 4411		Research for Managers	3
HMG 4440		Health Care Operations Management	3
HMG 4445	HMG 4446	Health Care Marketing and	
		Communication 1, 2	6
HMG 4580		Information Processing in Health Care	3
HMG 4652	HMG 4653	Health Management Practicum 1++, 2++	8
HSC 4310		Public Health 1	3

Professional Specialization

See Option 1, 2, 3, or 4 on next page

General Electives as needed to complete total credits**

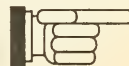
Total Quarter Hours

174

*It is strongly advised that students take these courses at the beginning of their studies.

++Students must have completed seventy-five percent of their degree requirements before taking these courses. Students must apply for each assignment no later than one full quarter prior to the desired starting date. Petition forms and detailed directions can be obtained by calling the Program Office, 617-373-5796.

**Up to 30 q.h. allowed in business subjects.



Professional Specialization Options

Students complete their course of study by electing one of the following options designed to meet their professional objectives.

Option 1: Continuing Care Administration

Licensure as a nursing home administrator requires an internship, a licensure examination, and a bachelor's degree. The required courses in this option help prepare students for the Massachusetts Licensure Examination. Students are advised, however, to contact the Board of Registration of Nursing Home Administrators for the specific eligibility requirements needed for this examination.

HMG 4600	HMG 4601	HMG 4602	Long-Term Care Administration (A, B, C)*	18
<i>Choose nine quarter hours from the following:</i> HMG, HSC, SOC				9

*This series of courses will be offered in 1996-97 academic year. They will be offered next in academic year 1998-99.

Option 2: Community Health Management

HMG 4310	HMG 4311	Principles and Practices of Community Health 1, 2	6
MLS 4341	MLS 4342	Epidemiology 1, 2	6
HSC 4311		Public Health 2	3
Choose 12 quarter hours from the following: HMG, HRM, HSC, MKT, SOC			12

Option 3: General Health Management

<i>Choose courses from (EMS, HIA, HMG, HSC, MLS, NUR, RAD)</i>				15
<i>Choose 12 quarter hours from the following:</i> ECN, ENG, FI, HRM, MGT, POL				12

Option 4: A.S. Transfer Option to Health Management B.S.

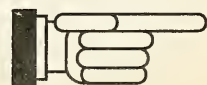
(Requires prior completion of the professional certification program. Students may transfer their A.S. degree under this option.)

Paramedic Technology AS degree
Medical Laboratory Technician AS degree
Radiologic Technology AS degree

Health Science

With the rapidly changing health care industry and the steadily expanding awareness of the importance of health, many new and exciting opportunities exist for those interested in the health care field. The bachelor of science in Health Science program seeks to address the needs of both health professionals seeking a broad-based baccalaureate degree as well as those interested in investigating a variety of disciplines within health. For those who already possess training as health professionals, maximum transfer of professional coursework is possible. Those entering from other fields or investigating career options in health will find a curriculum which allows flexibility in choosing coursework towards a specific goal. A program of upper-level courses and advanced sciences allows the student flexibility in pursuing a variety of post baccalaureate options as well.

Students should be aware that in order to work in certain health professions, certification or licensure is required. Please refer to page 105 for names and telephone numbers of consultants in various health fields.



Health Science Bachelor of Science in Health Science Degree (Major Code 865)



Liberal Arts Core

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
MTH 4107	College Algebra 4
MTH 4108	Precalculus 4
MTH 4120	Calculus 1 4
COM 4101	Foundations of Computer Literacy 4
Liberal Arts courses of your choice (AFR, ART, ASL, CMN, ECN, ENG, HST, JRN, LN, MTH, MUS, PHL, POL, PSY, SOA, SOC, TCC, THE)	24

Science Major Concentration

BIO 4107/BIO 4110	Biology 1/Lab for Biology 1	3/1
BIO 4108/BIO 4111 <i>or</i> BIO 4109/BIO 4112	Biology 2 <i>or</i> 3/Lab for Biology 2 <i>or</i> 3	3/1

BIO 4161/BIO 4165	Human Anatomy and Physiology 1/Lab for Human Anatomy and Physiology 1	3/1
BIO 4162/BIO 4166	Human Anatomy and Physiology 2/Lab for Human Anatomy and Physiology 2	3/1
BIO 4163/BIO 4167	Human Anatomy and Physiology 3/Lab for Human Anatomy and Physiology 3	3/1

BIO 4207/BIO 4210	Microbiology 1/Lab for Microbiology 1	2/1
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CHM 4133/CHM 4140	Chemical Principles 1/Lab for Chemical Principles 1	3/1
CHM 4134/CHM 4141	Chemical Principles 2/Lab for Chemical Principles 2	3/1
CHM 4135/CHM 4142	Chemical Principles 3/Lab for Chemical Principles 3	3/1

Choose 12 quarter hours from the following:

BIO 4125 through BIO 4605	CHM 4230 through CHM 4383	
MTH 4121 through MTH 4132	PHY 4101 through PHY 4198	12

Health Major Concentration

HMG 4100 HMG 4101	Managing Health Services Organizations 1, 2	6
HMG 4301	Health Care Delivery Systems	3
HSC 4310	Public Health 1	3
MLS 4341	Epidemiology 1	3
HMG 4200	Health Science Statistics	3
HMG 4215	Health Law	3
HSC 4301 HSC 4302	Pathophysiology 1, 2	6
HSC 4320 HSC 4321	Training and Development in the Health Professions 1, 2	6



Professional Specialization Options

Option 1: Comprehensive Health Science

Choose 20 quarter hours of HSC courses.

Choose 12 quarter hours of HSC, HMG, HIA, MLS, NUR, or RAD courses.

Note: Some courses may only be open to students admitted to respective program.

Option 2: Environmental Health and Safety Specialization



Required

HSC 4315	Environmental Problems and Health	3
HSC 4350	Introduction to Environmental Health and Safety	3
HSC 4352	Environmental Law	3
HSC 4354	Loss Prevention and Fire Safety	3
HSC 4401	Occupational Safety	3
HSC 4402	Health Hazards of Workplace Environments	3
HSC 4403	Environmental Compliance	3
HSC 4404	Hazardous Waste Management	3
HSC 4501	Industrial Toxicology	3

General Electives as needed to complete total credits, including the following recommended Option 2 electives:

HSC 4502	Industrial Hygiene Measurements	3
HSC 4503	Engineering Control of Chemical Hazards in the Workplace	3
HSC 4504	Recognition and Control of Non-Chemical Hazards in the Workplace	3

Option 3: A.S. Transfer to Health Science B.S.

(Requires prior completion of the professional certification program. Students may transfer their completed A.S. degree.)

Paramedic Technology A.S. degree

Medical Laboratory Technician A.S. degree

Radiologic Technology A.S. degree

Option 4: Medical Specialty Preparation to Health Science B.S.

Students completing admission requirements for Medical/Dental/Nursing School, Pharmacy School, Physician Assistant Programs, or Speech-Language Pathology and Audiology Pre-professional Preparation may transfer these credits toward a Health Science B.S.

General Electives as needed to complete total credits.

Recommended: CD 4102 *Career Decision Making* (1 q.h.) and/or CD 4103 *Exploring Career and Market Trends* (1 q.h.)

Medical Laboratory Science

Medical laboratory science (MLS) is concerned with laboratory examination of material necessary for monitoring health and for diagnosing and treating illness. Medical laboratory technicians and technologists work in a variety of specialized fields such as microbiology, blood banking, hematology immunology, or clinical chemistry, or as generalists in all of these areas.

The medical laboratory technician holding an associate's degree, works under the direct supervision of a medical technologist and performs common medical laboratory tests. The medical technologist, who must have a bachelor's degree, is considered qualified to perform tests with little or no direct supervision. Students interested in progressing past a technician level in Medical Laboratory Science should investigate the Bouvé College of Pharmacy and Health Sciences' full-time day bachelor's degree program or University College's part-time evening Bachelor of Science in Health Science program. It is imperative that students meet and plan out their coursework with the Medical Laboratory Science Program Director (617-373-3664) prior to beginning work in this major. This will assure appropriate course selection in order to qualify for clinical certification(s). With additional education or experience, medical technologists can become educators, researchers, or supervisors. They may serve as sales and technical representatives for scientific supply and equipment companies or serve in government positions.

The associate's degree program is conducted in affiliation with Boston-area hospitals and is accredited by the Committee of Allied Health Education and Accreditation of the American Medical Association. Upon successful completion of the associate's degree program, the student is eligible to take a national certification examination given by the National Certification Agency for Medical Laboratory Personnel or the Board of Registry of the American Society of Clinical Pathologists.

The basic courses in medical laboratory science, science, and education are offered evenings, but the advanced medical laboratory science courses and the clinical experience are offered full-time during the day only.

Associate's Degree Professional Requirements

A clinical applied study program (or appropriate work experience) is required for this degree. Work experience is acceptable if it meets the requirements for certification of either the National Certification Agency for Medical Laboratory Personnel or the Board of Registry of the American Society of Clinical Pathologists. Students without appropriate work experience can apply for clinical applied studies through the University College MLS Program Director, 206 Mugar, 617-373-3664. **This should be done one year in advance of the anticipated entry into clinical courses.**

To meet this program's residency requirement, the student must complete 12 quarter hours of MLS coursework at Northeastern University. Prerequisites for clinical applied studies are a minimum of a 2.0 quality-point average in the required courses and a C- or better in each medical laboratory science (MLS) course. These basic courses are available during the evening and on an every-other-year basis through the Bouvé College of Pharmacy and Health Sciences. Students register for these courses in the Bouvé College of Pharmacy and Health Sciences, 206 Mugar. Tuition is at a special rate. These courses should be completed within three years of applying to the AD-MLT Clinical Applied Studies.



Medical Laboratory Science--Medical Laboratory Technician Associate in Science Degree (Major Code 800)

**Core Courses**

		quarter hours
ENG 4100	Critical Writing 1	4
ENG 4111 ENG 4112	Critical Writing 2, 3	6
MTH 4107 MTH 4108	College Algebra, Precalculus	8

BIO 4107/BIO 4110	Biology 1/Lab for Biology 1	3/1
BIO 4109/BIO 4112	Biology 3/Lab for Biology 3	3/1

BIO 4161/BIO 4165	Human Anatomy and Physiology 1/Lab for Human Anatomy and Physiology 1	3/1
BIO 4162/BIO 4166	Human Anatomy and Physiology 2/Lab for Human Anatomy and Physiology 2	3/1
BIO 4163/BIO 4167	Human Anatomy and Physiology 3/Lab for Human Anatomy and Physiology 3	3/1

CHM 4133/CHM 4140	Chemical Principles 1/Lab for Chemical Principles 1	3/1
CHM 4134/CHM 4141	Chemical Principles 2/Lab for Chemical Principles 2	3/1
CHM 4135/CHM 4142	Chemical Principles 3/Lab for Chemical Principles 3	3/1

Major Concentration Courses*

MLS 4301	Medical Laboratory Science Orientation	2
MLS 1112/MLS 1212	Renal Physiology/Urinalysis†/Lab for Renal Physiology/Urinalysis†	2/1
MLS 1172	Immunology†	2
MLS 1125/MLS 1225	Hematology/Lab for Hematology	4/1
MLS 1145/MLS 1245	Microbiology†/Lab for Microbiology	4/1
MLS 1132/MLS 1232	Immunohematology†/Lab for Immunohematology†	3/1
MLS 1152/MLS 1252	Clinical Chemistry and Instrumentation†/Lab for Clinical Chemistry†	4/1
MLS 1412	MLT Special Topics†	2
MLS 1423	MLT Hematology Applied Study†	2
MLS 1432	MLT Immunohematology Applied Study†	2
MLS 1442	MLT Microbiology Applied Study†	2
MLS 1452	MLT Clinical Chemistry Applied Study†	2
MLS 1480	MLT Seminar 1†	2

Electives

Computer science or Liberal Arts electives as needed to complete total credit

Total Quarter Hours**89**

*Challenge examinations are available for many of the major concentration courses. Those working in the field may want to investigate this option by speaking with the program director at 617-373-3664.

†Tuition for this course is at a special rate. Call 617-373-3664 to register.

Nursing (RN-BSN Study Option, Evening Section)

The College of Nursing's Bachelor of Science degree in Nursing, accredited by the National League for Nursing, is offered to Registered Nurses as a part-time curriculum schedule through University College. This study option enables Registered Nurses with preparation at the diploma or associate's degree level to attain a baccalaureate degree in Nursing. Consistent with the philosophy of the College of Nursing and its curriculum, this study option has a strong community focus with emphasis on the prevention of illness and the promotion of health. Candidates for admission to this study option are assessed on an individual basis culminating in a comprehensive review of their personal and professional growth through a portfolio developed in NUR 4403 *Professional Transitions in Nursing*, which is the first nursing course students take in the program. Part of the instructor's role in this course is to assist students in the preparation of the portfolio. At the conclusion of this assessment, coupled with review of previous nursing education, qualifying students will be granted advanced placement credit of 96 quarter hours. Other avenues of advanced placement are open to the RN-BSN student consistent with regular University College transfer credit and residence policies. Academic progression policies of the College of Nursing Baccalaureate program (students must attain a grade of 2.0 or better in each NUR course) also apply to this study option. Students must also maintain an overall q.p.a. of 2.0 or better to remain in good academic standing.

Admission Requirements and Procedures

Admission application packets are available from the Health Professions and Science Office, 266 Ryder Hall, or by calling 617-373-5796.

The following items are required for admission to this study option and should be forwarded to the Office of Academic and Student Affairs, University College, 180 Ryder Hall, Northeastern University, 360 Huntington Avenue, Boston, MA 02115:

- Completed RN-BSN Nursing Program Application.
- Official transcripts from basic nursing program.
- Official transcripts from all colleges/universities attended. (If college courses were completed while attending a diploma nursing program, an individual transcript from that college must be included.)
- Evidence of current Massachusetts licensure as a Registered Nurse.
- Evidence of current CPR certification.*
- Evidence of current Professional Nurse Liability insurance.* (Students without liability insurance may contact the Health Professions and Science Office to arrange for coverage through Northeastern.)
- Health clearance.* (Health clearance is obtained from the Lane Health Center. Evidence of a tuberculin skin test within the previous twelve months and a hepatitis vaccine statement must be provided).

*These clearances and proofs must be updated annually with the Health Professions and Sciences Office. All admitted Nursing students will receive a reminder letter once a year asking for updated proof of CPR, insurance and health clearance.

Advising and Planning a Program of Study

Prospective students are encouraged to attend group information sessions in order to increase their awareness of College of Nursing and University College policies. These sessions cover course requirements, academic promotion policies, advanced placement procedures, and the process of petitioning for admission. To register for one of these sessions, call 617-373-5796.



Pre-admission and academic advising are available by calling the Office of Academic and Student Affairs at 617-373-2400 or TTY 617-373-2825 (for Deaf and hearing impaired only) for an appointment.

Prospective and current students may obtain a **preliminary** status report and transfer credit evaluation, detailing courses that are acceptable for transfer from other institutions as well as the remaining coursework to be completed by contacting the Office of Academic and Student Affairs, 617-373-2400 or TTY 617-373-2825. An **official** status report and transfer credit evaluation will be issued after review of the portfolio and previous nursing education in NUR 4403 *Professional Transitions in Nursing* and successful completion of the course.

To graduate, students must successfully complete each required course and all electives to total 174 q.h., with an overall q.p.a. of 2.0 or better. To be considered for graduation with honor, students must have completed at least 72 q.h. of credit at University College. Credit earned through transfer credit, examination or portfolio review is not considered toward honors designations.

Nursing (Evening Section) Bachelor of Science in Nursing (Major Code 809)



Please note: students must complete at least 45 q.h. in residence at University College.

Core Courses

	quarter hours
Advanced standing credit for successful completion of prerequisite, which does not count toward residence requirement	96
ENG 4100 Critical Writing 1	4
ENG 4111 Critical Writing 2	3
(These English courses will normally be included in the 96 q.h. advanced standing credit package but if equivalent courses were not taken previously, they must be taken at U.C. and open electives will be reduced accordingly)	
ENG 4112 Critical Writing 3	3
ECN 4250 ECN 4251 Statistics 1, 2	(6)
or	or
ECN 4254 Statistics Intensive B	(6)
COM 4101 Foundations of Computer Literacy	4
HST elective Any history course	3
PHL elective* Any philosophy course	3
ECN 4130 Medical Economics	3

Major Concentration Courses**

NUR 4403 Professional Transitions in Nursing	4
(Students will prepare a portfolio in NUR 4403 and qualified students will then receive the 96 q.h. advanced standing credit package noted above.)	(96)
NUR 4402 Health Assessment	4
NUR 4503 Nursing and the Community	7
NUR 4502 Introduction to Nursing Research	4
NUR 4508 Management and Leadership in Nursing	6

Electives

Humanities (AFR 4151, ART, ASL, CMN, ENG, JRN, LN, MUS, PHL, TCC, THE)	9
Open electives	22

Total Quarter Hours

174

*PHL 4165 *Moral Problems in Medicine* is recommended.

**Students must submit a petition to enter each nursing course. Petitions must be submitted to the Health Professions and Sciences Office at least one full quarter in advance of registering. Health clearance, CPR certification and liability insurance must be up-to-date in order to register for NUR courses.

Paramedic Technology

University College provides the opportunity to earn a certificate as well as an associate's degree in Paramedic Technology. Major concentration areas involve the EMT-Paramedic's roles, responsibilities and the subject areas required by Massachusetts Department of Public Health regulations and national guidelines. These areas include: medical terminology, patient assessment and initial management, airway and ventilation, pathophysiology of shock, general pharmacology, trauma and burns, respiratory system, cardiovascular system, endocrine emergencies, nervous system, acute abdomen, genitourinary and reproductive systems, anaphylaxis, toxicology, alcoholism and drug abuse, infectious diseases, environmental injuries, geriatrics, pediatrics, obstetrics, gynecological and neonatal emergencies, behavioral emergencies, EMS systems, medical/legal considerations, communications, rescue, major incident response, and stress management.

Admissions requirements: completion and submission of an application form; high school diploma or equivalent; national, state or provincial certification as an Emergency Medical Technician; official high school and college transcripts; entrance examination; Admissions Committee interview; and physical examination.

Students who successfully complete the Paramedic Technology Certificate courses may continue with the liberal arts and computer courses necessary for an Associate in Science in Paramedic Technology Degree.

Whether or not students continue on to the associate level, all those certified in Paramedic Technology may apply for and take the National Registry of Emergency Medical Technicians Paramedic Certification Examination.

Paramedic Technology Associate in Science Degree (Major Code 874)



Major Concentration/Certificate Courses

			quarter hours
EMS 4117	EMS 4118	EMS 4119	Emergency Medical Services
EMS 4120			1, 2, 3, 4
EMS 4121	EMS 4122		Emergency Medical Services 5, 6
EMS 4123			Emergency Medical Service 7
BIO 4215/BIO 4217			Human Anatomy and Physiology A/Lab for Human Anatomy and Physiology A
			3/1
BIO 4216/BIO 4218			Human Anatomy and Physiology B/Lab for Human Anatomy and Physiology B
			3/1

Liberal Arts and Computer Courses

ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
MTH 4110	MTH 4111	Contemporary Algebra 1, 2	6
CMN 4101		Fundamentals of Human Communication	3
PSY 4110		Introduction to Psychology: Fundamental Issues	3
PSY 4112		Introduction to Psychology: Personal Dynamics	3
HST 4103		The Civilization of the Modern World	3
LNS 4200		Spanish for the Medical Professions	4
COM 4101		Foundations of Computer Literacy	4
Electives			3

Total Quarter Hours

96

Radiologic Technology

The Radiologic Technology program is a joint offering of the University and several area hospitals. Classroom experience is provided by the University, and the clinical practicum is conducted at an assigned affiliated hospital. The program is accredited by the Joint Review Committee for Education in Radiologic Technology.

The Radiologic Technologist is a skilled professional employed in the diagnostic areas of the healthcare facility, as well as in quality control and inspection. Students in the Radiography program get experience in all aspects of medical radiography and gain limited exposure to advanced imaging and therapeutic areas such as computerized tomography, magnetic resonance imaging, ultrasonography, nuclear medicine, and radiation therapy. Each of the three associate of science degree options allows graduates to continue into the bachelor of science degree programs in health science or health management through University College.

Entrance Criteria: Satisfactory completion of three years of high school math, one year of biology, and one year of chemistry or physics. Applicants should also submit a letter of recommendation from a science instructor. Alternatively, applicants may submit a letter from a current employer addressing the applicant's potential to succeed in the program.

Candidates who meet the above requirements should file an application and supply all necessary documents by the appropriate deadline. (See below.) No candidate will be considered until all documents and fees are received in the program office. Only admitted students are allowed to take Radiologic Technology (RAD) courses, (RAD 4100 through RAD 4124). For more information, call 617-373-2818.

Associate in Science Degree *Full-Time Day Program* (806)

Students in the day option of the Radiologic Technology Program are considered full-time day students and are degree candidates. This associate in science degree program is a full-time day program on the Boston campus. Graduates are eligible for certification by the American Registry of Radiologic Technologists as well as licensure as a Radiographer by the Commonwealth of Massachusetts. The full-time day curriculum is scheduled over twenty-seven months with early exit options available for students with transfer credit or students who wish to take an accelerated course sequence. Early exit provides graduates with the opportunity to enter the job market and/or begin work on their bachelor's degree studies. Class size is limited. The application deadline for the full-time day program is March 1.

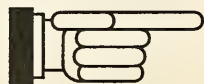
Associate in Science Degree *Part-Time Evening Program* (811)

A part-time evening option exists for students unable to participate in the full-time day program. Required academic classes are scheduled during the evening over twenty-four consecutive months. The majority of the professional courses are offered at our Dedham campus. Following the academic courses, the student will complete the program requirements by participating in up to one year of full-time clinical experience in an assigned hospital setting. Class size is limited. The application deadline for the part-time program is March 1.

Part-Time Evening Program for Radiographers (810)

University College also offers an associate of science degree program for registered technologists; the program requires fewer major concentration courses.

Candidates who wish to apply to this program must document satisfactory completion of an accredited certificate program in radiologic technology or be certified by the American Registry of Radiologic Technologists.



Radiologic Technology Associate in Science Degree (Major Codes 806/811)



Core Courses

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
MTH 4110 MTH 4111	Contemporary Algebra 1, 2 6
BIO 4107/BIO 4110	Biology 1/Lab for Biology 1 3/1
BIO 4161/BIO 4165	Human Anatomy and Physiology 1/ Lab for Human Anatomy and Physiology 1 3/1
BIO 4162/BIO 4166	Human Anatomy and Physiology 2/Lab for Human Anatomy and Physiology 2 3/1
BIO 4163/BIO 4167	Human Anatomy and Physiology 3/Lab for Human Anatomy and Physiology 3 3/1
COM 4101	Foundations of Computer Literacy 4
HMG 4100	Managing Health Services Organizations 1 3
PSY 4110	Introduction to Psychology: Fundamental Issues 3

Major Concentration Courses (Only admitted students allowed to take RAD courses; must be passed with a C or better.)

RAD 4100 RAD 4101	Radiologic Technology Orientation 1, 2 6
RAD 4085 RAD 4086	Radiologic Science 1, 2 6
RAD 4104 RAD 4105	Principles of Radiology 1, 2 8
RAD 4106 RAD 4107	Radiologic Photography and Exposure 1, 2 8
RAD 4108 RAD 4109 RAD 4110	Radiology Practicum 1, 2, 3, 4 12
RAD 4111	Radiographic Lab 1, 2 0
RAD 4123 RAD 4124	Cross-Sectional Anatomy 3
RAD 4307	Advanced Radiologic Technology 1, 2 6
RAD 4300 RAD 4301	Radiation Protection—Radiobiology 3
RAD 4308	Contemporary Studies in Radiologic Technology 3
RAD 4302	

Total Quarter Hours

97

Part-Time Associate in Science Degree Program for Radiographers (Major Code 810)



Core Courses

	quarter hours
Transfer credit for completion of prerequisite*	50
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
MTH 4110 MTH 4111	Contemporary Algebra 1, 2 6
BIO 4107/BIO 4110	Biology 1/Lab for Biology 1 3/1
COM 4101	Foundations of Computer Literacy 4
HMG 4100	Managing Health Services Organizations 1 3
PSY 4110	Introduction to Psychology: Fundamental Issues (3)
or	or
PSY 4111	Introduction to Psychology: Developmental Aspects (3)

Major Concentration Courses

RAD 4307	Cross-Sectional Anatomy 3
RAD 4301	Advanced Radiologic Technology 2 3
RAD 4308	Radiation Protection—Radiobiology 3
RAD 4460	Medical Imaging Quality Assurance 3

Total Quarter Hours

92

*Prerequisite: Satisfactory completion of a certificate program in radiologic technology or registration by the American Registry of Radiologic Technologists.

Liberal Arts Degree Programs

Rose A. Doherty,
Assistant Dean, Director,
Liberal Arts Programs
 266 Ryder Hall
 617-373-2416, 373-2423; 373-2825 (TTY)

Nancy Bandoian,
Assistant to the Director,
Liberal Arts Programs

Program Consultants and Advisors

ART: Fine Arts and Graphic Design

Consultant: Prof. Peter Serenyi,
 Dept. of Art and Architecture
 (College of Arts and Sciences) (617-373-2347)
Associate Consultant and Program Advisor:
 Daniel Vardaro (617-373-2416)

ASL: American Sign Language

Consultant/Program Advisor:
 ASL Program (College of Arts and Sciences)
 (617-373-3064 / TTY 617-373-3067)

CMN: Communication Studies

Consultant/Program Advisor:
 Prof. Anne F. Mattina,
 Communication Studies Dept.
 (College of Arts and Sciences) (617-373-5517)

ECN: Economics

Consultant: Prof. John Adams, Chair,
 Economics Dept.
 (College of Arts and Sciences) (617-373-2872)
Associate Consultant/Program Advisor:
 Dr. Herbert J. Eskot (617-964-4718)

ED: Education

Consultant: Prof. Maurice Kaufman
 Education Department
 (College of Arts and Sciences) (617-373-3302)

ENG: English (Literature or Writing)

Consultant: Prof. M. X. Lesser,
 English Dept.
 (College of Arts and Sciences) (617-373-2416)
Associate Consultant, Business Writing:
 Rosemarie Dittmer (617-373-2416)

HST: History

Consultant: Prof. Raymond H. Robinson,
 History Dept. (College of Arts and Sciences)
Associate Consultant/Program Advisor:
 Prof. Gerald H. Herman, History Dept.
 (College of Arts and Sciences) (617-373-2660)

INT: Paralegal Studies

Consultant/Program Director: Marjorie A. Duffy
 (617-320-8024)

JRN: Journalism

Consultant/Program Advisor: Prof. Charles Fountain
 (School of Journalism) (617-373-3236)

LN: Modern Languages

Consultant: Prof. Holbrook Robinson,
 Modern Languages Dept.
 (College of Arts and Sciences) (617-373-8881)

MUS: Music

Consultant: Prof. Joshua R. Jacobson,
 Music Dept. (College of Arts and Sciences)
Associate Consultant/Program Advisor:
 Marjorie Atlas, Music Dept.
 (College of Arts and Sciences) (617-373-2440)

PHL: Philosophy and Religion

Consultant: Prof. Susan Setta,
 Chair, Philosophy Dept.
 (College of Arts and Sciences) (617-373-3636)

POL: Political Science

Consultant: Prof. L. Gerald Bursey,
 Political Science Dept.
 (College of Arts and Sciences) (617-373-2796)

PSY: Psychology

Consultant/Program Advisor:
 Prof. Charles Karis, Psychology Dept.
 (College of Arts and Sciences)
Associate Consultant:
 Prof. Harold Zamansky, Psychology Dept.
 (College of Arts and Sciences) (617-373-3076)

SOA: Sociology-Anthropology and

SOC: Sociology

Consultant: Prof. Michael Blim,
 Sociology Dept. (College of Arts and Sciences)
 (617-373-2686)

TCC: Technical Communications

Consultant/Program Advisor:
 Neil F. Duane (President, Boston
 Documentation Design) (617-380-0740)

THE: Theatre

Consultant: Prof. Don E. Lewis, Chair,
 Theatre Dept.
 (College of Arts and Sciences) (617-373-2244)

Purpose

Through the liberal arts curricula offered by University College, students are guided in their independent and creative discovery of ideas and methods in the areas of humanities, natural sciences, and social sciences.

University College believes that a liberal arts education enables students to make more intelligent and realistic appraisals of self and career. The Liberal Arts Programs at the college present students with both a challenge to bring meaning and focus to the educational experience and an opportunity to acquire marketable knowledge and skills.

Programs

University College offers bachelor of arts and bachelor of science degrees in art, economics, English, history, political science, psychology, sociology-anthropology, and international politics, culture, and trade. Unlike the bachelor of science degree, the bachelor of arts degree includes a language requirement. Bachelor of science degrees are offered in graphic design and visual communication, in technical communications, and in the popular combined program, Liberal Arts with Business Minor. In addition, degree programs in English, political science, and sociology-anthropology present professional concentrations designed to teach specialized skills.

Liberal Arts bachelor's degree candidates are permitted to earn up to 44 quarter hours of credit (25 percent of the credits toward a bachelor's degree) in business subjects. Students may be eligible for the minor in business administration, see page 128.

Bachelor's Degree in Liberal Studies

University College offers a bachelor of arts degree in liberal studies designed to help students develop communication, analytical, and research skills while exploring the great ideas of the ages as well as contemporary issues. The program's courses are grouped in four areas:

- *Communication and Critical Thinking*
- *Cultural Heritage*
- *Science, Research, and Quantitative Methods*
- *Contemporary Studies.*

The courses in each area are selected to provide students with a breadth of disciplinary perspectives.

Forty-five quarter hours of elective credits are permitted to allow students to take a certificate program or select individual courses in accordance with their personal and career interests.

Upon approaching completion of individual coursework in *Cultural Heritage*, students take an interdisciplinary seminar to integrate their learning experiences.

Associate in Science Degree

An associate in science degree program in arts and sciences is offered for those who want a general background in liberal arts but do not want to pursue a major field of concentration for the bachelor's degree. Students who do wish to go on to a bachelor's degree should check with an academic advisor to be sure that the courses they select for the A.S. degree will fit into their chosen bachelor's program.

Minor in Business Administration

The Minor in Business Administration will be available to all nonbusiness students at University College if they meet the following standards: 80 earned quarter hours, 2.0 q.p.a., and completion of all background courses. Nonbusiness students may find the minor attractive if they are considering a career in business or pursuing an MBA. The minor consists of 10 required courses, 4 background courses, and 2 electives. Students who wish to enter the program should speak with an advisor in the Office of Academic and Student Affairs upon successfully meeting the standards listed above. Students who complete all 12 required courses successfully and have earned at least a C (2.0) average in them will be awarded a minor in Business Administration at graduation.

Background courses:

ECN 4115 ECN 4116
MTH 4110 MTH 4111

Economic Principles and Problems 1, 2
Contemporary Algebra 1, 2

Required courses:

MGT 4101 MGT 4102
ACC 4101 ACC 4102
HRM 4301 HRM 4302
FI 4301 FI 4302

Introduction to Business and Management 1, 2
Accounting Principles 1, 2
Organizational Behavior 1, 2
Principles of Finance and
Financial Management
Introduction to Marketing 1
Marketing Management

MKT 4301
MKT 4320

Electives:

Selection of one of the following four sets of courses (depending on student interest):

- | | | |
|--------------|----------|--|
| 1. MGT 4450 | MGT 4451 | Business Policy 1*, 2 |
| 2. MGT 4340 | MGT 4341 | Small Business 1, 2 |
| 3A. MGT 4446 | | International Business Management
and Operations** |
| B. MGT 4455 | | Manager and Society** |
| 4A. OM 4404 | | Service Operations Management** |
| B. MGT 4410 | | Project Management Process: Planning
and Implementation** |

*Must have 130 q.h. to register.

**Must have 80 q.h. to register.



*Fast-track for the Management BSBA, the Management Information
Systems (MIS) BSBA, and Liberal Arts with a Business Minor*

ACCEL, the premier accelerated management program for adults in the Boston region, will enable students to speed up the study of their Management BSBA, MIS BSBA or Liberal Arts with Business Minor. If you have relevant transfer credit or take College Level Examination Program (CLEP) examinations in certain subjects, you can finish even faster.

The **ACCEL** program is very flexible. You can start the program at any point. This way, if you have completed an associate's degree program, have other transfer credit or can take CLEP examinations for certain subjects, you will have a head start, or a lighter course load in an academic quarter.

The program is offered on the Boston and Burlington campuses on Friday nights and Saturday mornings with the exception of the summer quarter when the schedule reverts to the Monday through Thursday evening format. Many of the courses in the program are offered at a reduced tuition rate.

Please call 617-373-2400 or TTY 617-373-2825 to request a brochure explaining the

ACCEL program.

Certificate Programs

Students who seek specialized skills to advance their careers may choose from the following liberal arts certificate programs, which they may take independently or in conjunction with degree study:

- American Sign Language 40
- American Sign Language-English Interpreting 57
- Business Communication 41
- Computer Graphics 43
- Deaf Studies 46
- Gender and Family Studies 47
- Paralegal Studies 215
- Technical Writing 53
- Writing 54

Special Studies

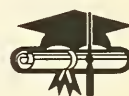
University College offers a variety of Special Studies. These courses give students an opportunity to earn credits in Advanced Tutorials, Independent Studies, Honors Programs, and Field Work. Consult descriptions on pages 24-25.

Assessment of Prior Learning Program (APL)

Some students may petition for prior learning or life experience credit, in specified liberal arts, health, and business subjects. See page 28 for details. Credit cannot be awarded through APL when an appropriate examination is available through CLEP, PEP, or DANTES.

Degrees

Arts and Sciences Associate in Science Degree (Major Code 372)



Core Courses

ENG 4100	Critical Writing 1
ENG 4111 ENG 4112	Critical Writing 2, 3

quarter hours

4
6

Major Concentration Courses

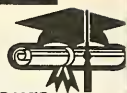
Humanities (AFR 4151, ART, ASL, CMN, ENG, JRN, LN, MUS, PHL, TCC, THE)	24
Math-Science (BIO, CHM, ESC, MTH, PHY)	18
Social Sciences (AFR 4131, AFR 4132, AFR 4193, ECN, HST, POL, PSY, SOA, SOC)	24

Electives*	11
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Total Quarter Hours	87
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*Recommended: CD 4110 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*.

Economics Bachelor of Arts Degree (Major Code 390)



Core Courses

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
MTH 4110 MTH 4111	Contemporary Algebra 1, 2 6
Modern Language	Conversational 12
	Intermediate 12
Humanities (AFR 4151, ART, ASL, CMN, ENG, JRN, LN, MUS, PHL, TCC, THE)	24
Math-Science (BIO, CHM, ESC, MTH, PHY)	12
Social Sciences (AFR 4131, AFR 4132, AFR 4193, HST, POL, PSY, SOA, SOC)	18

Major Concentration Courses

ECN 4115 ECN 4116 ECN 4117	Economic Principles & Problems 1, 2, 3	9
ECN 4137	History of Economic Thought	3
ECN 4215 ECN 4217	Macroeconomic Theory 1, 2	6
ECN 4216 ECN 4218	Microeconomic Theory 1, 2	6
ECN 4250 ECN 4251 ECN 4252	Statistics 1, 2, 3	9

Electives

Economics	24
Open electives*	23

Total Quarter Hours

174

*Recommended: CD 4100 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*.

Economics Bachelor of Science Degree with Certificate in Finance (Major Code 390)



Core Courses

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
MTH 4110 MTH 4111	Contemporary Algebra 1, 2 6
Social Sciences (AFR 4131, AFR 4132, AFR 4193, HST, POL, PSY, SOA, SOC)	12

Major Concentration Courses

ECN 4115 ECN 4116 ECN 4117	Economic Principles & Problems 1, 2, 3	9
ECN 4137	History of Economic Thought	3
ECN 4215 ECN 4217	Macroeconomic Theory 1, 2	6
ECN 4216 ECN 4218	Microeconomic Theory 1, 2	6
ECN 4250 ECN 4251 ECN 4252	Statistics 1, 2, 3	9

Finance Certificate Courses

ACC 4101 ACC 4102 ACC 4103	Accounting Principles 1, 2, 3	9
FI 4301	Principles of Finance	3
FI 4302	Financial Management	3
FI 4310	Investment Principles	3
FI 4320	Credit Principles	3
FI 4325	Budgeting and Planning	3

Electives

Economics	24
Liberal Arts	42
Open electives* †	23

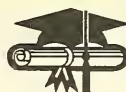
Total Quarter Hours

174

*Up to 20 q.h. allowed in business subjects.

†Recommended: CD 4100 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*.

English Bachelor of Arts Degree (Major Code 330)



Core Courses

	quarter hours
ENG 4100	4
ENG 4111 ENG 4112	6
Modern Language	12
Critical Writing 1	12
Critical Writing 2, 3	12
Conversational Intermediate	18
Math-Science (BIO, CHM, ESC, MTH, PHY)	24
Social Sciences (AFR 4131, AFR 4132, AFR 4193, ECN, HST, POL, PSY, SOA, SOC)	

Major Concentration Courses

ENG 4120	English Literature: Faith and Humanism	3
ENG 4121	English Literature: Reason and Romanticism	3
ENG 4122	English Literature: Victorians and Moderns	3
ENG 4123	Early American Literature: Faith, Reason, and Nature	3
ENG 4124	American Romantics and American Realists	3
ENG 4125	American Literature: The Modern Temper	3
ENG 4131	God, Gods, and Heroes: The Literature of the Ancient and Medieval Worlds	3
ENG 4132	Man, Reason, and Imagination: Literature from the Renaissance to the Romantic Age	3
ENG 4133	Order and Disorder: Literature of the Moderns	3
ENG 4349 ENG 4350	Expository and Persuasive Writing 1, 2	6
ENG 4352	Expository Communications	3
ENG 4604	Major Figure in Literature*	3
ENG 4658	Introduction to Shakespeare	(3)
or	or	
ENG 4659	Shakespeare: The Major Tragedies and Comedies	(3)

Choose one of two concentrations for twenty-seven quarter hours:

I. Literature

Select nine courses from the ENG 4200 or ENG 4600 series in the course descriptions on pages 192-195. (27)

II. Writing

Choose six courses from the ENG 4300 or ENG 4500 series or ENG 4242, ENG 4243; and three courses from either the JRN or TCC courses. (27)

Electives

English (ENG 4200 and up)	9
Open electives**	17

Total Quarter Hours 174

*Course may be taken more than once, focusing on a different figure each time.

**Recommended: INT 4200 *Workshop in Creativity* and CD 4100 *Managing Career Decisions*.

English Bachelor of Science Degree (Major Code 330)



Core Courses

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
Math-Science (BIO, CHM, ESC, MTH, PHY)	18
Social Sciences (AFR 4131, AFR 4132, AFR 4193, ECN, HST, POL, PSY, SOA, SOC)	24

Major Concentration Courses

ENG 4120	English Literature: Faith and Humanism	3
ENG 4121	English Literature: Reason and Romanticism	3
ENG 4122	English Literature: Victorians and Moderns	3
ENG 4123	Early American Literature: Faith, Reason, and Nature	3
ENG 4124	American Romantics and American Realists	3
ENG 4125	American Literature: The Modern Temper	3
ENG 4131	God, Gods, and Heroes: The Literature of the Ancient and Medieval Worlds	3
ENG 4132	Man, Reason, and Imagination: Literature from the Renaissance to the Romantic Age	3
ENG 4133	Order and Disorder: Literature of the Moderns	3
ENG 4349 ENG 4350	Expository and Persuasive Writing 1, 2	6
ENG 4352	Expository Communications	3
ENG 4604	Major Figure in Literature*	6
ENG 4658	Introduction to Shakespeare	(3)
or	or	
ENG 4659	Shakespeare: The Major Tragedies and Comedies	(3)

Choose one of two concentrations for twenty-seven quarter hours:

I. Literature

Choose nine courses from the ENG 4200 or ENG 4600 series in the course descriptions on pages 192-195. (27)

II. Writing

Select six courses from the ENG 4300 or ENG 4500 series or ENG 4242, ENG 4243; and three courses from either the JRN or TCC courses. (27)

Electives

English (ENG 4200 and up)	9
Open electives**	41

Total Quarter Hours

174

*Course may be taken more than once, focusing on a different figure each time.

**Recommended: INT 4200 *Workshop in Creativity* and CD 4100 *Managing Career Decisions* or the Minor in Business Administration (see page 128).

Fine Arts Bachelor of Arts Degree (Major Code 327)



Core Courses

	quarter hours
ENG 4100	4
ENG 4111 ENG 4112	6
Modern Language	12
	12
Math-Science (BIO, CHM, ESC, MTH, PHY)	18
Social Sciences (AFR 4131, AFR 4132, AFR 4193, ECN, HST, POL, PSY, SOA, SOC)	24

Major Concentration Courses

ART 4100	History of Art to the Fourth Century	3
ART 4101	History of Art to the Sixteenth Century	3
ART 4102	History of Art to the Twentieth Century	3
ART 4106	Introduction to Art	3
ART 4112	Visual Foundations*	3

Electives

Art	36
Open electives**†	47

Total Quarter Hours

174

*3 1/2-hour studio.

**Up to 44 q.h. allowed in business subjects.

†Recommended: INT 4200 *Workshop in Creativity* and CD 4100 *Managing Career Decisions* or the Minor in Business Administration (see page 128).

Fine Arts Bachelor of Science Degree (Major Code 327)



Core Courses

	quarter hours
ENG 4100	4
ENG 4111 ENG 4112	6
Math-Science (BIO, CHM, ESC, MTH, PHY)	18
Social Sciences (AFR 4131, AFR 4132, AFR 4193, ECN, HST, POL, PSY, SOA, SOC)	24

Major Concentration Courses

ART 4100	History of Art to the Fourth Century	3
ART 4101	History of Art to the Sixteenth Century	3
ART 4102	History of Art to the Twentieth Century	3
ART 4106	Introduction to Art	3
ART 4112	Visual Foundations*	3

Electives

Art	36
Open electives**†	71

Total Quarter Hours

174

*3 1/2-hour studio.

**Up to 44 q.h. allowed in business subjects.

†Recommended: INT 4200 *Workshop in Creativity* and CD 4100 *Managing Career Decisions* or the Minor in Business Administration (see page 128).

Graphic Design and Visual Communication Associate in Science Degree (Major Code 362)

**Core Courses****Communication**

ENG 4100	Critical Writing 1	4
ENG 4111 ENG 4112	Critical Writing 2, 3	6
CMN 4101	Fundamentals of Human Communication	3
PHL 4100	Philosophical Thinking	3

Social Sciences

HST 4101	The Civilization of the Ancient and Medieval Worlds	3
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One history course from the following:

(HST 4102, 4103, 4201, 4202, 4203, 4600 to 4646)		3
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SOC 4100	Roles, Culture, and the Individual	3
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One Sociology course from SOC 4101 to 4276.		3
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Business

ACC 4101	Accounting Principles 1	3
MGT 4101	Introduction to Business and Management 1	3
MKT 4301	Introduction to Marketing 1	3

Major Concentration Courses**Art/Graphics**

ART 4105	Art through the Ages	3
ART 4110	Modern Art	3
ART 4112	Visual Foundations*	3
ART 4121	Principles of Drawing and Composition*	3
ART 4135	Design Fundamentals*	3
ART 4139	Color Theory and Practice*	3
ART 4140	Graphic Communication and Production	3
ART 4141 ART 4142	Graphic Design 1*, 2*	6
ART 4143	Advertising Design*	3
ART 4151	Typography	3
ART 4175	History of Graphic Design	3
ART 4181	Introduction to Computer Graphics*	3
ART 4251	Portfolio Development*	3
ART 4367	Pictorial Imagery for the Graphic Designer*	3

Open Electives**		5
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Total Quarter Hours**87**

*3 1/2-hour studio.

**Recommended: INT 4200 *Workshop in Creativity* and CD 4100 *Managing Career Decisions*.

Graphic Design and Visual Communication

Bachelor of Science Degree (Major Code 360)



Core Courses

Credits from associate's in science degree in graphic design and visual communication 87

Business Communication and Research

ENG 4380	ENG 4381	Writing for the Professions 1, 2	6
CMN 4251		Business and Professional Speaking	3
ECN 4115		Economic Principles and Problems 1	3
MGT 4330		Essentials for Managers of Small Businesses	3

Computer, Math, Science

MIS 4114		Introduction to PC Software	3
MTH 4110	MTH 4111	MTH 4112	Contemporary Algebra 1, 2, 3

Choose one of the following pairs:

BIO 4107	BIO 4108	Biology 1, 2	(6)
or		or	
CHM 4133	CHM 4134	Chemical Principles 1, 2	(6)
or		or	
ESC 4103		Introduction to the Earth Sciences: The Solid Earth	(3)
ESC 4104		Introduction to the Earth Sciences: Earth's Oceans and Atmosphere	(3)
or		or	
PHY 4101	PHY 4102	College Physics 1, 2**	(8)

Major Concentration Courses

ART 4160	Basic Photography*	3
ART 4176	International Directions in Graphic Design	3
ART 4183	Electronic Publishing Systems*	3
ART 4184	Presentation Graphics*	3
ART 4185	Creative Imaging: Custom Computer Design*	3
ART 4186	Computer Graphics Design Portfolio*	3
ART 4187	Advanced Computer Illustration*	3
ART 4188	Advanced Raster Graphics*	3
ART 4366	Promotional and Technical Publications: Design and Production*	3

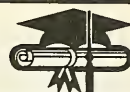
Electives** 27

Total Quarter Hours 174-176

*3 1/2-hour studio or lab.

**Physics and additional courses in humanities are recommended, as well as INT 4200 *Workshop in Creativity* and CD 4100 *Managing Career Decisions*.

History Bachelor of Arts Degree (Major Code 323)



Core Courses

	quarter hours
ENG 4100	4
ENG 4111 ENG 4112	6
Modern Language	12
Critical Writing 1	12
Critical Writing 2, 3	12
Conversational	12
Intermediate	12
Humanities (AFR 4151, ART, ASL, CMN, ENG, JRN, LN, MUS, PHL, TCC, THE)	24
Math-Science (BIO, CHM, ESC, MTH, PHY)	18
Social Sciences (in three of the following areas: ECN, POL, PSY, SOA, SOC)	18

Major Concentration Courses

Introductory Courses

HST 4101	The Civilization of the Ancient and Medieval Worlds	3
HST 4102	The Civilization of the Early Modern World	3
HST 4103	The Civilization of the Modern World	3
HST 4201	American History 1763-1848	3
HST 4202	American History 1848-1917	3
HST 4203	American History Since 1917	3

Historical Skill Requirement

HST 4241	The Historian's Craft	3
HST 4265	Introduction to Public History	3

Regional Distribution

Choose one course from each of the following three regional groupings:

European: any course with a HST 44 prefix	3
American: any course with a HST 45 prefix	3
Other: any course with a HST 46 prefix	3

Thematic Distribution

Choose four courses from one of the following groups A-H, or if qualified, complete Group F, Honors (12 q.h.).

Group A: America's Ethnic Roots (AFR 4131, 4132, HST 4404, 4434, 4435, 4454, 4501, 4515, 4543, 4544, 4602, 4604, 4611, 4622, 4632, 4636)	(12)
Group B: America's Social and Economic History (HST 4263, 4509, 4518, 4530, 4531, 4532, 4533, 4534, 4535, 4536, 4537, 4540, 4541, 4542, 4544, 4546, 4547, 4548, 4549, 4563)	(12)
Group C: Contemporary History (HST 4250, 4417, 4424, 4425, 4445, 4455, 4460, 4461, 4466, 4468, 4470, 4473, 4507, 4508, 4509, 4510, 4511, 4512, 4513, 4515, 4518, 4523, 4530, 4531, 4532, 4533, 4534, 4535, 4536, 4537, 4546, 4547, 4548, 4549, 4551, 4561, 4563, 4602, 4603, 4604, 4606, 4611, 4622, 4623, 4624, 4632, 4636, 4640, 4643, 4644, 4645, 4646, 4825)	(12)
Group D: Technological History (HST 4270, 4301, 4302, 4303, 4304, 4305, 4535, 4536, 4537, 4643, 4644)	(12)
Group E: Women and Family History (HST 4263, 4305, 4416, 4434, 4435, 4515, 4540, 4542, 4640)	(12)
Group G: The Ancient and Medieval World (HST 4250, 4401, 4403, 4407, 4408, 4409, 4410, 4412, 4414, 4415, 4418, 4419, 4825)	
Group H: The Early Modern and Modern World (HST 4250, 4410, 4415, 4418, 4419, 4444, 4445, 4446, 4452, 4453, 4454, 4466, 4502, 4503, 4505, 4506, 4508, 4509, 4518, 4523, 4530, 4531, 4546, 4547, 4548, 4549, 4550, 4560, 4563, 4825)	

Electives* (preferably other than history)

35

Total Quarter Hours

174

*Recommended: CD 4100 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*, or the Minor in Business Administration (see page 128).

History Bachelor of Science Degree (Major Code 323)



Core Courses

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
MIS 4114	Introduction to PC Software 3
MIS 4115	Introduction to Computers and Information Systems 3
SOC 4320	Statistics 3
SOC 4331 SOC 4333	Research Methods 1, 2 6
Humanities (AFR 4151, ART, ASL, CMN, ENG, JRN, LN, MUS, PHL, TCC, THE)	24

Social Sciences

Choose two groups (three courses in each group) from the following:

ECN 4115 ECN 4116 ECN 4117	Economic Principles and Problems 1, 2, 3	(9)
or	or	
POL 4103	Introduction to Politics	(3)
POL 4104	Introduction to American Government	(3)
POL 4105	Introduction to Comparative Politics	(3)
or	or	
PSY 4110	Introduction to Psychology: Fundamental Issues	(3)
PSY 4111	Introduction to Psychology: Developmental Aspects	(3)
PSY 4112	Introduction to Psychology: Personal Dynamics	(3)
or	or	
SOA 4100	Physical Anthropology	(3)
SOA 4101	Cultural Anthropology: Kinship Societies	(3)
SOA 4102	Cultural Anthropology: State Societies	(3)
or	or	
SOC 4100	Roles, Culture, and the Individual	(3)
SOC 4101	Inequality and Institutions	(3)
SOC 4102	Institutions and Social Change	(3)

Major Concentration Courses

Introductory Courses

HST 4101	The Civilization of the Ancient and Medieval Worlds	3
HST 4102	The Civilization of the Early Modern World	3
HST 4103	The Civilization of the Modern World	3
HST 4201	American History 1764-1848	3
HST 4202	American History 1848-1917	3
HST 4203	American History Since 1917	3

Historical Skill Requirement

HST 4241	The Historian's Craft	3
HST 4263	Oral History	3
HST 4265	Introduction to Public History	3
HST 4821	Field Work in History (or related APL credit)	6

Regional Distribution

Choose one course from each of the following regional groupings:

European: any course with a HST 44 prefix	3
American: any course with a HST 45 prefix	3
Other: any course with a HST 46 prefix	3



Thematic Distribution

Choose four courses from one of the following groups A-H, or if qualified, complete Group F, Honors (12 q.h.).

Group A: America's Ethnic Roots (HST 4404, 4434, 4435, 4501, 4515, 4543, 4544, 4602, 4604, 4611, 4622, 4632, 4636) (12)

Group B: America's Social and Economic History (HST 4509, 4518, 4530, 4531, 4532, 4533, 4534, 4535, 4536, 4537, 4540, 4541, 4542, 4544, 4546, 4547, 4548, 4549, 4563) (12)

Group C: Contemporary History (HST 4250, 4417, 4424, 4425, 4445, 4455, 4460, 4461, 4466, 4468, 4470, 4473, 4507, 4508, 4509, 4510, 4511, 4512, 4513, 4515, 4518, 4523, 4530, 4531, 4532, 4533, 4534, 4535, 4536, 4537, 4546, 4547, 4548, 4549, 4551, 4561, 4563, 4602, 4603, 4604, 4606, 4611, 4622, 4623, 4624, 4632, 4636, 4640, 4643, 4644, 4645, 4646, 4825) (12)

Group D: Technological History (HST 4270, 4301, 4302, 4303, 4304, 4305, 4535, 4536, 4537, 4643, 4644) (12)

Group E: Women and Family History (HST 4305, 4434, 4435, 4515, 4540, 4542, 4640) (12)

Group G: The Ancient and Medieval World (HST 4250, 4401, 4403, 4407, 4408, 4410, 4412, 4414, 4415, 4418, 4419, 4825)

Group H: The Early Modern and Modern World (HST 4250, 4410, 4415, 4417, 4418, 4419, 4444, 4445, 4446, 4452, 4453, 4466, 4502, 4503, 4505, 4506, 4508, 4509, 4515, 4518, 4523, 4530, 4531, 4546, 4547, 4548, 4549, 4550, 4560, 4563, 4825)

Electives (preferably other than history)*† 53

Total Quarter Hours 174

*Up to 44 q.h. allowed in business subjects.

†Recommended: CD 4100 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*, or the Minor in Business Administration (see page 128).

International Politics, Culture, and Trade



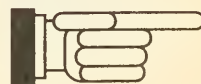
The bachelor of arts in International Politics, Culture, and Trade helps provide the strong liberal arts and business foundation needed for employment in today's world where international and intercultural business is growing. Students will learn about international issues and develop sensitivity to other cultures through the coursework in politics and culture. Students will also develop their business acumen by completing courses related to international trade. The modern language requirement will give students the understanding of a culture that comes only with knowledge of the language. Employment opportunities are as varied as the growing international economy.

International Politics, Culture, and Trade Bachelor of Arts (Major Code 324)



Core Courses		quarter hours
ENG 4100	Critical Writing 1	4
ENG 4111 ENG 4112	Critical Writing 2, 3	6
ENG 4380 ENG 4381	Writing for the Professions 1, 2	6
MTH 4110 MTH 4111	Contemporary Algebra 1, 2	6
PSY 4110	Introduction to Psychology: Fundamental Issues	3
PSY 4111	Introduction to Psychology: Developmental Aspects	3
PSY 4112	Introduction to Psychology: Personal Dynamics	3
ECN 4115 ECN 4116 ECN 4117	Economic Principles and Problems 1, 2, 3	9
Core Courses--Liberal Arts		
CMN 4235	Intercultural Communication	3
ECN 4250 ECN 4251	Statistics 1, 2	6
HST 4101	Civilization of the Ancient and Medieval Worlds	3
HST 4102	Civilization of the Early Modern World	3
HST 4103	Civilization of the Modern World	3
PHL 4100	Philosophical Thinking	3
PHL 4180	Business Ethics	(3)
or	or	
PHL 4200	Logic	(3)
POL 4103	Introduction to Politics	3
POL 4105	Introduction to Comparative Politics	3
SOC 4100	Roles, Culture, and the Individual	3
Modern Language	Conversational	12
	Intermediate	12
Core Courses--Business Administration		
ACC 4101 ACC 4102	Accounting Principles 1, 2*	6
FI 4301	Principles of Finance*	3
FI 4302	Financial Management*	3
HRM 4301 HRM 4302	Organizational Behavior 1, 2*	6
MGT 4101 MGT 4102	Introduction to Business and Management 1, 2*	6
MKT 4301	Introduction to Marketing 1*	3
MKT 4320	Marketing Management*	3

*Note: business courses may not exceed 42 q.h. total in the program, including electives.



Politics Grouping (*Choose three courses*)

9

POL 4307

Politics of Health in International
Development

POL 4330

Comparative Politics

POL 4331

International Relations

POL 4332

International Organization

POL 4333

International Law

POL 4338 to POL 4367

International and Regional Politics

Culture Grouping (*Choose three courses*)

9

HST 4400 or 4600 Series

International History

LNF 4225

Culture of the European Economic
Community

LNJ 4225

Japanese Culture

LNR 4225

Russian Culture and Society

SOA 4434

Latin American Peoples and Cultures

SOA 4431

African Peoples and Cultures

SOC 4178

Cultural Diversity in the Workplace

Trade Grouping (*Choose three courses*)

9

BL 4316

International Business Law*

ECN 4334

Comparative Economic Systems

ECN 4335

International Trade

ECN 4336

International Monetary Economics

FI 4450

International Finance*

HRM 4345

Comparative International Labor
Relations Systems*

HRM 4347

Managing People in International
Settings*

MGT 4446

International Business Management and
Operations*

MGT 4357

Cultural Issues in International
Business*

MGT 4348

The Global Marketplace*

MKT 4453

International Marketing*

Non-Business Electives

20

Total

174

*Note: business courses may not exceed 42 q.h. total, including electives.

Liberal Arts with Business Minor

Bachelor of Science Degree (Major Code 373)



Basic Courses

Courses			Quarter Hours
ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
ENG 4380	ENG 4381	Writing for the Professions 1, 2	6
MTH 4110	MTH 4111	Contemporary Algebra 1, 2	6
PSY 4110		Introduction to Psychology: Fundamental Issues	3
PSY 4111		Introduction to Psychology: Developmental Aspects	3
PSY 4112		Introduction to Psychology: Personal Dynamics	3
ECN 4115	ECN 4116	ECN 4117 Economic Principles and Problems 1, 2, 3	9

Core Courses--Liberal Arts

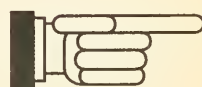
ECN 4250 ECN 4251	Statistics 1, 2	6
PHL 4100	Philosophical Thinking	3
PHL 4180	Business Ethics	3
PHL 4200	Logic	3
POL 4103	Introduction to Politics	3
POL 4104	Introduction to American Government	3
POL 4105	Introduction to Comparative Politics	3
SOC 4100	Roles, Culture, and the Individual	3
SOC 4101	Inequality and Institutions	3
SOC 4102	Institutions and Social Change	3

Choose 6 courses from:

HST 4101	The Civilization of the Ancient and Medieval Worlds	(3)
HST 4102	The Civilization of the Early Modern World	(3)
HST 4103	The Civilization of the Modern World	(3)
HST 4201	American History 1763-1848	(3)
HST 4202	American History 1848-1917	(3)
HST 4203	American History Since 1917	(3)
or	or	
any HST course with a 46 prefix (international history)		(3)

Core Courses--Business Administration

ACC 4101 ACC 4102	Accounting Principles 1, 2	6
FI 4301	Principles of Finance	3
FI 4302	Financial Management	3
HRM 4301 HRM 4302	Organizational Behavior 1, 2	6
MGT 4101 MGT 4102	Introduction to Business and Management 1, 2	6
MKT 4301	Introduction to Marketing 1	3
MKT 4320	Marketing Management	3



Business Electives: Select one of the following four sets of courses

1. MGT 4450	MGT 4451	Business Policy 1,* 2	(6)
2. MGT 4340	MGT 4341	Small Business 1, 2	(6)
3 A. MGT 4446		International Business Management and Operations**	(3)
B. MGT 4455		Manager and Society**	(3)
4 A. OM 4404		Service Operations Management **	(3)
B. MGT 4410		Project Management Process: Planning and Implementation**	(3)

Electives

Literature/Writing: Select 2 courses from the ENG 4200, 4300, or 4600 series (course descriptions, pages 192-195)

Nonbusiness electives† 6

Total Quarter Hours

174

*Requires 130 q.h. of credit to register.

**Requires 80 q.h. of credit.

†Recommended: Art, Music, Theatre and other Humanities. Also suggested are INT 4200 *Workshop in Creativity* and CD 4100 *Managing Career Decisions*.

ACCEL

Fast-track for the Management BSBA, the Management Information Systems (MIS) BSBA, and Liberal Arts with a Business Minor

ACCEL, the premier accelerated management program for adults in the Boston region, will enable students to speed up the study of their Management BSBA, MIS BSBA or Liberal Arts with Business Minor. If you have relevant transfer credit or take College Level Examination Program (CLEP) examinations in certain subjects, you can finish even faster.

The **ACCEL** program is very flexible. You can start the program at any point. This way, if you have completed an associate's degree program, have other transfer credit or can take CLEP examinations for certain subjects, you will have a head start, or a lighter course load in an academic quarter.

The program is offered on the Boston and Burlington campuses on Friday nights and Saturday mornings with the exception of the summer quarter when the schedule reverts to the Monday through Thursday evening format. Many of the courses in the program are offered at a reduced tuition rate.

Please call 617-373-2400 or TTY 617-373-2825 to request a brochure explaining the **ACCEL** program.

Liberal Studies Bachelor of Arts Degree (Major Code 495)



Core Courses

quarter hours

Communication and Critical Thinking

ENG 4100		Critical Writing 1	4
ENG 4111	ENG 4112	Critical Writing 2, 3	6
INT 4200		Workshop in Creativity	3
PHL 4100		Philosophical Thinking	3
PHL 4105		Philosophy of Knowing and Reality	3
PHL 4200		Logic	3
CMN 4101		Fundamentals of Human Communication	3
CMN 4102		Group Discussion	3
ENG 4380		Writing for the Professions 1	3

Cultural Heritage

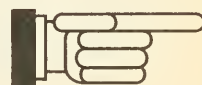
ART 4105		Art through the Ages	3
ECN 4137		History of Economic Thought	3
ENG 4131		God, Gods, and Heroes: Literature of the Ancient and Medieval Worlds	3
ENG 4132		Man, Reason, and Imagination: Literature from the Renaissance to the Romantic Age	3
ENG 4133		Order and Disorder: Literature of the Moderns	3
HST 4101		The Civilization of the Ancient and Medieval Worlds	3
HST 4102		The Civilization of the Early Modern World	3
HST 4103		The Civilization of the Modern World	3
INT 4203		Independent Study in Cultural Heritage	3
MUS 4120		Music Appreciation: The Masterworks of Western Civilization	3
POL 4110		The Great Political Thinkers	3

Science, Research, and Quantitative Methods

CHM 4105		Chemistry and the Environment	3
ECN 4250	ECN 4251	Statistics 1, 2	6
ENG 4381		Writing for the Professions 2	3
MIS 4114		Introduction to PC Software	3
MIS 4115		Introduction to Computers and Information Systems	3
MTH 4110	MTH 4111	MTH 4112	9
Science (BIO, CHM, ESC, PHY)		Contemporary Algebra 1, 2, 3	6 - 8

Contemporary Studies

ECN 4115	ECN 4116	Economic Principles and Problems 1, 2	6
ECN 4334		Comparative Economic Systems	3
POL 4105		Introduction to Comparative Politics	3
PSY 4110		Introduction to Psychology: Fundamental Issues	3
Psychology (any PSY course)			3
SOA 4155		Individual and Culture	3
SOC 4100		Roles, Culture, and the Individual	3
Sociology (any two SOC courses)			6



Electives*†

47

Electives may be used

- to take a University College certificate program
- to study a modern language or other area in greater depth
- to study areas of personal or career interest
- to complete a Minor in Business Administration (see page 128).

Students are encouraged to make an appointment with a University College advisor for help in selecting electives. Call 617-373-2400 or TTY 617-373-2825 for an appointment.

Total Quarter Hours

174

*Up to 44 q.h. allowed in business subjects.

†Recommended: CD 4100 *Managing Career Decisions* (see page 174 for course description).

Political Science Bachelor of Arts Degree (Major Code 322)



Core Courses

	quarter hours
ENG 4100	4
ENG 4111 ENG 4112	6
Modern Language	12
Critical Writing 1	12
Critical Writing 2, 3	12
Conversational	24
Intermediate	18
Humanities (AFR 4151, ART, ASL, CMN, ENG, JRN, LN, MUS, PHL, TCC, THE)	18
Math-Science (BIO, CHM, ESC, MTH, PHY)	18
Social Sciences (in three of the following areas: ECN, HST, PSY, SOA, SOC)	18

Major Concentration Courses

POL 4103	Introduction to Politics	3
POL 4104	Introduction to American Government	3
POL 4105	Introduction to Comparative Politics	3
POL 4331	International Relations	3
POL 4370	Introduction to Political Theory	3

American Government

Choose three of the following:

POL 4310	American Political Thought	(3)
POL 4313	State and Local Government	(3)
POL 4314	Urban and Metropolitan Government	(3)
POL 4318	The American Presidency	(3)
POL 4319	The Legislative Process	(3)
POL 4320	American Constitutional Law	(3)
POL 4321	Civil Liberties	(3)
POL 4322	Criminal and Civil Due Process	(3)

Comparative Government

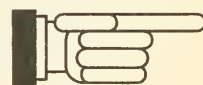
Choose two of the following:

POL 4330	Comparative Politics	(3)
POL 4338	European Political Parties	(3)
POL 4339	Government and Politics of Russia	(3)
POL 4342	Eastern Europe in Transition	(3)
POL 4350	Politics and Policies of the Developing Nations	(3)
POL 4352	Government and Politics of Latin America	(3)
POL 4356	Government and Politics of Northern Africa	(3)
POL 4357	Government and Politics of South Africa	(3)
POL 4359	Government and Politics in the Middle East	(3)
POL 4362	Government and Politics of Southeast Asia	(3)
POL 4365	Government and Politics of China	(3)
POL 4367	Government and Politics of Japan	(3)

International Relations

Choose one of the following:

POL 4332	International Organization	(3)
POL 4333	International Law	(3)
POL 4335	Formulating American Foreign Policy	(3)
POL 4336	American Foreign Policy	(3)
POL 4341	Russian Foreign Policy	(3)
POL 4364	China's Foreign Policy	(3)



Theory and Methodology*Choose one of the following:*

SOC 4331	Research Methods 1*	(3)
POL 4371	Modern Political Theory	(3)

Electives

Political science	18
Open electives**	26

Total Quarter Hours 174

*Students who anticipate using quantitative methods are advised to take the full Research Methods sequence: SOC 4320, SOC 4331, SOC 4333.

**Recommended: CD 4100 *Managing Career Decisions*, INT 4200 *Workshop in Creativity*, and INT 4400 *Paralegal Studies*.

Political Science Bachelor of Science Degree (Major Code 322)



Core Courses

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111 ENG 4112	Critical Writing 2, 3 6
ECN 4250 ECN 4251	Statistics 1, 2 6
MIS 4114	Introduction to PC Software 3
MIS 4115	Introduction to Computers and Information Systems 3
Humanities (AFR 4151, ART, ASL, CMN, ENG, JRN, LN, MUS, PHL, TCC, THE)	12
Social Sciences (in three of the following areas: ECN, HST, PSY, SOA, SOC)	18
Math-Science (BIO, CHM, ESC, MTH, PHY)	6-8

Major Concentration Courses

POL 4103	Introduction to Politics	3
POL 4104	Introduction to American Government	3
POL 4105	Introduction to Comparative Politics	3
POL 4331	International Relations	3
POL 4370	Introduction to Political Theory	3

American Government

Choose three of the following:

POL 4310	American Political Thought	(3)
POL 4313	State and Local Government	(3)
POL 4314	Urban and Metropolitan Government	(3)
POL 4318	The American Presidency	(3)
POL 4319	The Legislative Process	(3)
POL 4320	American Constitutional Law	(3)
POL 4321	Civil Liberties	(3)
POL 4322	Criminal and Civil Due Process	(3)

Comparative Government

Choose two of the following:

POL 4330	Comparative Politics	(3)
POL 4338	European Political Parties	(3)
POL 4339	Government and Politics of Russia	(3)
POL 4342	Eastern Europe in Transition	(3)
POL 4350	Politics and Policies of the Developing Nations	(3)
POL 4352	Government and Politics of Latin America	(3)
POL 4356	Government and Politics of Northern Africa	(3)
POL 4357	Government and Politics of South Africa	(3)
POL 4359	Government and Politics in the Middle East	(3)
POL 4362	Government and Politics of Southeast Asia	(3)
POL 4365	Government and Politics of China	(3)
POL 4367	Government and Politics of Japan	(3)



International Relations

Choose one of the following:

POL 4332	International Organization	(3)
POL 4333	International Law	(3)
POL 4335	Formulating American Foreign Policy	(3)
POL 4336	American Foreign Policy	(3)
POL 4341	Russian Foreign Policy	(3)
POL 4364	China's Foreign Policy	(3)

Theory and Methodology

Choose one of the following:

SOC 4331	Research Methods 1*	(3)
POL 4371	Modern Political Theory	(3)

Electives

Political science	18
Open electives**	62

Total Quarter Hours

174-176

*Students who anticipate using quantitative methods are advised to take the full Research Methods sequence: SOC 4320, SOC 4331, SOC 4333.

**Up to 44 q.h. allowed in business subjects. Also recommended: CD 4100 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*, Minor in Business Administration (see page 128) and INT 4400 *Paralegal Studies*.

Psychology

Psychology, the scientific study of behavior and mental processes, is an interdisciplinary science that includes methods and knowledge derived from the other natural and social sciences. The psychology curriculum explores such topics as the neurobiological basis of behavior, sensory functioning, learning and memory, human development, emotion and motivation, how individuals function in groups, and what constitutes an abnormal personality. Through laboratory practice and experimentation, individual research projects, and small group seminars, the program encourages a critical evaluation of psychology's various theoretical perspectives, its past and present accomplishments, and future directions.

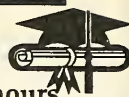
The bachelor of arts degree is intended for students who wish to pursue a broad liberal arts education that explores the humanities, the social sciences, and to a lesser extent, the natural sciences. Two years of language study are included.

The bachelor of science degree is more specialized and is usually recommended for students who have a strong scientific interest in psychology and the natural sciences.

The required major concentration courses for either degree prepare students for careers in teaching, business, public service, or research and provide a foundation for graduate study in all areas of psychology and related fields, as well as in areas such as law and medicine. Students who do not wish to extend their education beyond the bachelor's degree will find that their undergraduate training will help them find employment in public affairs, social services, education, business, and sales.

In keeping with the department's commitment to the scientific method, students are advised to take the statistical course sequence (PSY 4220, PSY 4221, and PSY 4222) as soon as their prerequisites have been satisfied (PSY 4110, PSY 4111, and PSY 4112). The major concentration courses (PSY 4231 Psychology of Learning, PSY 4272 Personality, PSY 4351 Physiological Psychology, and PSY 4381 Sensation and Perception) should follow shortly thereafter. In addition, students select courses from among related areas such as abnormal psychology, motivation, memory and thinking, developmental psychology, drugs and behavior, and psychology of women. The experimental psychology laboratory sequence (PSY 4561, PSY 4562, and PSY 4563) should be taken in the year prior to the expected graduation year. Finally in a senior seminar, students have the opportunity to integrate the knowledge and experience gained from this entire program of study.



Psychology Bachelor of Arts Degree (Major Code 319)**Core Courses**

		Quarter Hours
ENG 4100	Critical Writing 1	4
ENG 4111 ENG 4112	Critical Writing 2, 3	6
Modern Language	Conversational	12
	Intermediate	12
Humanities (AFR 4151, ART, ASL, CMN, ENG, JRN, LN, MUS, PHL, TCC, THE)		24
Math-Science (in three of the following areas: BIO, CHM, ESC, MTH, PHY)		18
Social Sciences (in three of the following areas: ECN, HST, POL, SOA, SOC)		18

Major Concentration Courses

PSY 4110			Introduction to Psychology: Fundamental Issues	3
PSY 4111			Introduction to Psychology: Developmental Aspects	3
PSY 4112			Introduction to Psychology: Personal Dynamics	3
PSY 4220	PSY 4221	PSY 4222	Statistics in Psychology 1, 2, 3	9
PSY 4231			Psychology of Learning	3
PSY 4272			Personality	3
PSY 4351			Physiological Psychology	3
PSY 4381			Sensation and Perception	3
PSY 4561	PSY 4562	PSY 4563	Experimental Psychology 1, 2, 3	9
PSY 4611			Senior Seminar in Psychology	3

Electives

Psychology	18
Open electives*	20

Total Quarter Hours**174***Recommended: CD 4100 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*.**Psychology Bachelor of Science Degree (Major Code 319)****Core Courses**

ENG 4100	Critical Writing 1	4
ENG 4111 ENG 4112	Critical Writing 2, 3	6
Math-Science (BIO, CHM, ESC, MTH, PHY)		30

Major Concentration Courses

PSY 4110			Introduction to Psychology: Fundamental Issues	3
PSY 4111			Introduction to Psychology: Developmental Aspects	3
PSY 4112			Introduction to Psychology: Personal Dynamics	3
PSY 4220	PSY 4221	PSY 4222	Statistics in Psychology 1, 2, 3	9
PSY 4231			Psychology of Learning	3
PSY 4272			Personality	3
PSY 4351			Physiological Psychology	3
PSY 4381			Sensation and Perception	3
PSY 4561	PSY 4562	PSY 4563	Experimental Psychology 1, 2, 3	9
PSY 4611			Senior Seminar in Psychology	3

Electives

Psychology	18
Open electives* †	74

Total Quarter Hours**174**

*Up to 44 q.h. allowed in business subjects.

†Recommended: CD 4100 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*, or Minor in Business Administration (see page 128).

Sociology-Anthropology Bachelor of Arts Degree (Major Code 321)



Core Courses

Core Courses		Quarter Hours
ENG 4100	Critical Writing 1	4
ENG 4111 ENG 4112	Critical Writing 2, 3	6
Modern Language	Conversational	12
	Intermediate	12
Humanities (AFR 4151, ART, ASL, CMN, ENG, JRN, LN, MUS, PHL, TCC, THE)		24
Math-Science (BIO, CHM, ESC, MTH, PHY)		18
Social Sciences (in three of the following areas: ECN, HST, POL, PSY)		18

Major Concentration Courses

SOA 4100	Physical Anthropology	3
SOA 4101	Cultural Anthropology: Kinship Societies	3
SOA 4102	Cultural Anthropology: State Societies	3
SOC 4100	Roles, Culture, and the Individual	3
SOC 4101	Inequality and Institutions	3
SOC 4102	Institutions and Social Change	3
SOC 4300 SOC 4301 SOC 4302	Social Theory 1, 2, 3	9
SOC 4320	Statistics	3
SOC 4331 SOC 4333	Research Methods 1, 2	6

Electives

Sociology-Anthropology (at least nine quarter hours in SOA)	21
Open electives*	23

Total Quarter Hours

174

*Recommended: CD 4100 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*.

Sociology-Anthropology Bachelor of Science Degree (Major Code 321)



Core Courses

	quarter hours
ENG 4100	4
ENG 4111 ENG 4112	6
Social Sciences (AFR 4131, AFR 4132, AFR 4193, ECN, HST, POL, PSY)	18

Major Concentration Courses

SOA 4100	Physical Anthropology	3
SOA 4101	Cultural Anthropology: Kinship Societies	3
SOA 4102	Cultural Anthropology: State Societies	3
SOC 4100	Roles, Culture, and the Individual	3
SOC 4101	Inequality and Institutions	3
SOC 4102	Institutions and Social Change	3
SOC 4300 SOC 4301 SOC 4302	Social Theory 1, 2, 3	9
SOC 4320	Statistics	3
SOC 4331 SOC 4333	Research Methods 1, 2	6

Electives*

Sociology-Anthropology (at least nine quarter hours in SOA)	39
Open electives (preferably in the humanities and math-science)**†	71

Total Quarter Hours

174

*Students may use these electives to take the Human Services Concentration.

**Up to 44 q.h. allowed in business subjects.

†Recommended: CD 4100 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*, or Minor in Business Administration (see page 128).



Human Services Elective Concentration (open only to B.S. degree candidates)

			quarter hours
SOC 4125		Social Problems*	3
SOC 4240		Sociology of Human Service Organizations*	3
SOC 4241		Human Services Professions*	3
SOC 4245		Poverty and Inequality*	3
SOC 4260		Introduction to Social Work Practice*	3
PSY 4110		Introduction to Psychology: Fundamental Issues**	3
PSY 4111		Introduction to Psychology: Developmental Aspects**	3
PSY 4112		Introduction to Psychology: Personal Dynamics**	3
PSY 4372	PSY 4373	PSY 4374	Abnormal Psychology 1, 2, 3**
Total Quarter Hours			33

*SOC courses can be used for SOC electives for B.S. degree.

**PSY courses can be used for Social Science electives for B.S. degree.

Recommended Open Electives for Human Services Concentration Students

ECN 4130	Medical Economics	3
ECN 4311	Human Resource Planning	3
ECN 4315	Income Inequality and Discrimination	3
POL 4300	Introduction to Public Administration	3
POL 4301	Case Studies in Public Administration	3
POL 4306	Public Policy Analysis	3
POL 4321	Civil Liberties	3
PSY 4240	Development: Infancy and Childhood	3
PSY 4241	Development: Adolescence	3
PSY 4242	Development: Adulthood and Aging	3
PSY 4272	Personality	3
SOC 4170	Race and Ethnic Relations	3
SOC 4185	Deviant Behavior	3
SOC 4186	Social Control	3
SOC 4190	Juvenile Delinquency	3
SOC 4215	Medical Sociology	3
SOC 4225	Social Gerontology	3

Also recommended: Gender and Family Studies Certificate, 24 q.h. (see p. 47)

Designed for community and human services professionals and those who wish to understand the dynamics of the modern family and workplace, this certificate combines courses in communication studies and sociology.

Technical Communications

The Technical Communications bachelor of science degree helps prepare students for careers as technical writers. Technical writers are needed in a variety of areas to write, update, and revise technical documents for the end user. In the program students are taught the writing, production, technical, planning, scheduling, and interpersonal skills that professionals in the field, whether free-lance or employed by a single company, will need. The core courses are complemented by required technical communications classes, and students are able to specialize in one of four tracks: high technology, computer science, environmental science, and health science. The large number of electives allows students to develop the broad background required in this professional field.

Technical Communications Bachelor of Science Degree (Major Code 380)



Core Courses

Basic Communication

	quarter hours
ENG 4100	Critical Writing 1 4
ENG 4111	Critical Writing 2, 3 6
ENG 4349	Expository and Persuasive Writing 1, 2 6
ENG 4380	Writing for the Professions 1, 2 6
ART 4140	Graphic Communication and Production 3
JRN 4112	Writing for Media 1 3
PHL 4100	Philosophical Thinking 3
PHL 4200	Logic 3
CMN 4152	Conducting Interviews in the Professions 3
MIS 4114	Introduction to PC Software 3
MTH 4110	Contemporary Algebra 1 3

Major Concentration Courses

TCC 4101	TCC 4102	Technical Writing 1, 2 6
TCC 4105		Editing for Science and Technology 3
TCC 4340		Documentation Development and Completion 3
TCC 4335		Introduction to On-Line Documentation 3

Choose four of the following:

TCC 4110		Technical-Promotional Writing (3)
TCC 4301	TCC 4302	Computer Software Technical Writing 1, 2 (6)
TCC 4311	TCC 4312	Instruction Manual Writing 1, 2 (6)
TCC 4320		Proposal Writing (3)
TCC 4330		The Business and Technical Presentation (3)



Choose one of four tracks:

1. High Technology Technical Writing		
Two different computer languages		
PHY 4101	PHY 4102	Physics 1, 2
		6
		8

2. Technical Writing for Computer Science		
MIS 4238	Introduction to the Internet	
MIS 4243	Visual Basic Programming	
MIS 4276	C Programming 1	
MIS 4283	Windows Programming	
		3
		3
		3
		3

3. Technical Writing for Environmental Science		
ESC 4103	Introduction to Earth Sciences:	
	Solid Earth	
		3
ESC 4104	Introduction to Earth Sciences:	
	Oceans and Atmosphere	
		3
ESC 4681	Science, Technology, and	
	Modern Societies	
		3
HSC 4315	Environmental Problems and Health	
		3

4. Technical Writing for Health Science		
BIO 4107	Biology 1	
		3
CHM 4133	Chemistry 1	
		3
HIA 4300	Medical Terminology	
		4
HSC 4310	Public Health 1	
		3

Open Electives*

90-92

The following electives are recommended:

ACC 4101	ACC 4102	Accounting Principles 1, 2	(6)
ART 4366		Promotional and Technical Publications: Design and Production**	(3)
ENG 4352		Expository Communications	(3)
MGT 4101	MGT 4102	Introduction to Business and Management 1, 2	(6)
TCC 4805		Field Work in Technical Communications	(6)

Total Quarter Hours

174-176

*Up to 44 q.h. allowed in business subjects. Also recommended: CD 4100 *Managing Career Decisions* and INT 4200 *Workshop in Creativity*, or Minor in Business Administration (see page 128).

**3 1/2-hour lab.

Alternative Freshman-Year Program (AFY)

Arlene Greenstein, Ph.D.,
Associate Dean and Director of
Special Programs

249 Ryder Hall
617-373-4626

George R. Atkinson, Director,
Alternative Freshman-Year Program

Jennifer J. Wells, Assistant to the Director,
Alternative Freshman-Year Program

Sally L. Solomon, Administrative Assistant,
Alternative Freshman-Year Program

Program Goals

Students in the Alternative Freshman-Year Program are full-time day students and degree candidates with an undeclared major. The program helps students strengthen their skills in writing, mathematics, and other college-level work. The program also offers students an opportunity to consider several areas of study before committing themselves to a specific major. Through the combination of a carefully prescribed curriculum and the attention of academic advisors, each student undertakes a program suited to his or her individual needs. Advisors are normally available throughout the student's entire freshman year.

Program Structure

Students in the Alternative Freshman-Year Program normally take sixteen quarter hours of credit during each of their three freshman quarters, but may take 12 quarter hours during any one quarter and still be considered full-time students. Students preparing for entrance to one of the programs in Northeastern's Bouvé College of Pharmacy and Health Science take a variety of course loads totaling up to 60 quarter hours, and usually requiring four consecutive quarters.

After completing the prescribed Alternative Freshman-Year Program and achieving both a cumulative quality-point average of 1.8 or higher and specific program requirements as noted, students may generally continue their degree programs by transferring with sophomore status, to any program in the College of Business Administration or the College of Criminal Justice, as well as most programs in the College of Arts and Sciences. Students may also continue their degree programs within University College. In addition to the cumulative quality-point average of 1.8 or higher, the College of Business Administration requires a 1.800 average in four key courses, namely, MTH 1113, ENG 4014, ECN 4601, and MGT 4110. A higher cumulative grade average is also required for entrance into several majors in the College of Arts and Sciences, such as Art and Architecture (2.5), Journalism (2.25), and Speech Communication (2.5).

AFY students entering the Bouvé College of Pharmacy and Health Science must complete 60 academic credits with a 3.0 GPA, including chemistry, biology, and advanced math courses. Entrance to the programs of Bouvé College is not guaranteed.

Faculty and Resources

The University has carefully selected faculty members who are aware of the individual needs and goals of AFY students; faculty and students meet in small classes of not more than twenty-five students.

AFY students have access to all physical education facilities, residence halls, counseling services, and co-curricular programs at the University's main campus in Boston, along with distinctly tailored schedules and curricula.

Alternative Freshman-Year students also use the up-to-date, programmed learning resources available for self-instruction through Northeastern's Learning Resources Center. The Academic Assistance Center, the Math/Writing Center, and the Counseling Center are also available to students. AFY students also benefit from the program's own peer-tutoring sessions.

Tuition and Fees

Tuition and fees for the Alternative Freshman-Year Program are the same as for students in the full-time Day Colleges. Payment of the standard tuition during the first three academic quarters of residence entitles students to forty-nine credit hours of instruction.

Application Procedures

For more information on the Alternative Freshman-Year Program, or to request an application, write or call the Dean of Admissions, Department of Admissions, Northeastern University, 360 Huntington Avenue, Boston, MA 02115, 617-373-2200.

Sample One-Year Program Business Track

		quarter hours
Quarter 1		
ED 4003	Integrated Language Skills A	4
ENG 4013	Fundamentals of English 1	4
MTH 1000	Mathematical Preliminaries 1*	4
HST 4110	History of Civilization A†	(4)
or	or	
ECN 4601	Economics 1	(2)
Total Quarter Hours		12-16
Quarter 2		
ED 4004	Integrated Language Skills B	4
ENG 4014	Fundamentals of English 2	4
MTH 1010	Mathematical Preliminaries 2*	4
HST 4110	History of Civilization A	(4)
or	or	
MGT 1115	Introduction to Business	(3)
Total Quarter Hours		16
Quarter 3		
ED 4005	Integrated Language Skills Seminar	1
HST 4111	History of Civilization B	4
MGT 4110	Survey of Business and Management	4
or	or	
ECN 4601	Economics 1	(2)
MTH 1113	Mathematics for Business*	4
ENG 1111	Freshman English 2	
	(or Directed Elective)	4
Total Quarter Hours		17

*Students will be placed in one of three math courses depending on placement test results. Those receiving advanced placement have the option of completing MTH 1114 during freshman year.

†Eligible students may take HST 4110 in the first quarter; all others take HST 4110 in the second quarter.

Sample One-Year Program: Criminal Justice, Undecided, Arts and Sciences Track

Quarter 1		quarter hours
ED 4003	Integrated Language Skills A	4
ENG 4013	Fundamentals of English 1	4
MTH 1000	Mathematical Preliminaries 1*	4
SOC 4010	Principles of Sociology 1	(4)
<i>or</i>	<i>or</i>	
HST 4110	History of Civilization A	(4)
Total Quarter Hours		12-16

Quarter 2

ED 4004	Integrated Language Skills B	4
ENG 4014	Fundamentals of English 2	4
HST 4110	History of Civilization A†	4
<i>or</i>	<i>or</i>	
SOC 4011	Principles of Sociology 2	(4)
MTH 1010	Mathematical Preliminaries 2*	(4)

Total Quarter Hours 16

Quarter 3

ED 4005	Integrated Language Skills Seminar	1
HST 4111	History of Civilization B	4
POL 4106	Introduction to Politics	4
SOC 4011	Principles of Sociology 2 (or Directed Elective)††	4
ENG 1111	Freshman English 2 (or Directed Elective)††	4

Total Quarter Hours 17

*Students will be placed in one of two math levels, depending on placement test results.

†Eligible students may take HST 4110 in the first quarter, followed by an elective in the second quarter. Most students will take HST 4110 in the second quarter.

††The Directed Elective is to be chosen with consideration for the student's intended major.

Sample One-Year Program: Health Sciences Track

Quarter 1		quarter hours
MTH 1010	Mathematical Preliminaries 2*	4
ENG 4013	Fundamentals of English 1	4
CHM 1110	Pre-Chemistry	5
ED 4001	Integrated Language Skills Development 1	2
Total Quarter Hours		15

Quarter 2

MTH 1106	Fundamentals of Mathematics*	4
ENG 4014	Fundamentals of English 2	4
CHM 1111	General Chemistry 1	5
ED 4002	Integrated Language Skills Development 2	2

Total Quarter Hours 15

*Students will be placed in one of two math levels, depending on placement test results.



Quarter 3

ED 4005	Integrated Language Skills Seminar	1
BIO 1140	Basic Animal Biology 1	4
CHM 1122	General Chemistry 2	5
ENG 1111	Freshman English 2	4
D. Elec.	Directed Elective**	4

Total Quarter Hours**18****Quarter 4**

BIO 1141	Basic Animal Biology 2	4
MTH 1107	Functions and Calculus*	4
D. Elec.	Directed Elective**	4

Total Quarter Hours**12**

*Students will be placed in one of two math levels, depending on placement test results.

**The Directed Elective is to be chosen with consideration for the student's intended major.

Course Descriptions

Not all the courses listed in this *Bulletin* are offered every year. A final list of courses to be offered is contained in the University College *Schedule Guide*, which gives the hours and days that classes meet and their locations. These schedules are issued prior to the fall, winter, spring, and summer quarters.

Abbreviations

q.h.: quarter hours (credit earned)
 cl.: hours required in class per week
 Coreq.: Corequisite
 Prereq.: Prerequisite

Key To Department Codes

ACC	Accounting	LNF	Language—French
AFR	African-American Studies	LNG	Language—German
ART	Art and Graphic Design	LNI	Language—Italian
ASL	American Sign Language	LNJ	Language—Japanese
BIO	Biology/Biotechnology	LNR	Language—Russian
BL	Business Law	LNS	Language—Spanish
CD	Career Development	MGT	Management
CHM	Chemistry	MIS	Management Information Systems
CJ	Criminal Justice and Security	MKT	Marketing
CMN	Communication Studies	MLS	Medical Laboratory Science
COM	Computer Literacy	MTH	Mathematics
CRS	Special Education	MUS	Music
ECN	Economics	NUR	Nursing
ED	Education	OM	Operations Management
EMS	Emergency Medical Services	PED	Physical Education
ENG	English	PHL	Philosophy and Religion
ESC	Earth Sciences	PHY	Physics
FI	Finance	POL	Political Science
HIA	Health Information Administration	PSY	Psychology
HMG	Health Management	RAD	Radiologic Technology
HRM	Human Resources Management	RE	Real Estate
HSC	Health Science	SLA	Speech-Language Pathology and Audiology
HST	History	SOA	Sociology-Anthropology
HTL	Hotel and Restaurant Management	SOC	Sociology
INT	Interdisciplinary	TCC	Technical Communications
JRN	Journalism	THE	Theatre
		TRN	Transportation

ACCOUNTING

ACC 4101 Accounting Principles 1 (3 q.h.)

Study of accounting issues and objectives for proper preparation and interpretation of financial statements. Covers the nature, function, and environment of accounting, the basic accounting model, and the accounting cycle, while emphasizing accounting for service and merchandising businesses. Also covers cash and accounts receivable.

ACC 4102 Accounting Principles 2 (3 q.h.)

Continuation of ACC 4101. Emphasizes issues in financial reporting, valuation, and income measurement. Includes inventories, plant and equipment, bonds, present value, and stockholders' equity. *Prereq.* ACC 4101.

ACC 4103 Accounting Principles 3 (3 q.h.)

Continuation of ACC 4102. Statement of cash flows and preparation and interpretation of cost accounting information and its uses in the managerial decision-making process. Includes ratio analysis, analysis of cost-volume relationships, fixed and variable costs, break-even analysis, job order, and introduction to standard cost systems. *Prereq.* ACC 4102.

ACC 4105 Accounting Principles 1 and 2 (Intensive) (6 q.h.)

Same as ACC 4101 and ACC 4102.

ACC 4120 Essentials of Personal Income Taxation (3 q.h.)

Special course for non-accounting majors, designed to teach important aspects of personal income taxation on both federal and state levels. Tax laws, tax planning, and the preparation of individual returns are emphasized.

ACC 4301 Intermediate Accounting 1 (3 q.h.)

Introduction to financial accounting concepts, techniques, and procedures. Areas of intensive treatment are the development and framework of accounting theory, basic financial statements, and cash and receivables. *Prereq.* ACC 4103.

ACC 4302 Intermediate Accounting 2 (3 q.h.)

Continuation of the study of accounting concepts and procedures. Detailed examination of inventories, tangible and intangible assets, and depreciation. *Prereq.* ACC 4301.

ACC 4307 Intermediate Accounting 3 (3 q.h.)

Continuation of the study of accounting concepts and procedures, with emphasis given to conceptual aspects of measurement of liabilities and to alternative accounting treatments and procedures. *Prereq.* ACC 4302.

ACC 4310 Cost Accounting 1 (3 q.h.)

Examines cost determination, cost behavior, costing systems, and an introduction to budgeting. *Prereq.* ACC 4103.

ACC 4360 Accounting for Business

Combinations (formerly ACC 4320) (3 q.h.)

A study of accounting issues associated with business combinations, including the purchase and pooling methods of consolidation. *Not open to students who have taken ACC 4320. Prereq.* ACC 4408 or ACC 4404.

ACC 4361 Advanced Accounting Issues

(formerly ACC 4321) (3 q.h.)

The focus of this course will include an examination of accounting issues associated with governmental and nonprofit organizations. Other advanced accounting topics such as multinationals are also considered. *Not open to students who taken ACC 4321. Prereq.* ACC 4408 or ACC 4404.

ACC 4400 Accounting Information Systems (Reserved) (3 q.h.)

Provides a broad survey of accounting information systems concepts and applications. Examines how computer technology impacts accounting information processing and how accounting systems can be effectively controlled. *Prereq.* MIS 4102, ACC 4310, ACC 4307 and 80 q.h.

ACC 4408 Intermediate Accounting 4 (Reserved) (3 q.h.)

This course completes the intensive study of measurement and reporting issues in modern accounting practice. Emphasis is given to such topics as stockholder's equity and earnings per share. *Prereq.* ACC 4307 and 80 q.h.

ACC 4411 Cost Accounting 2 (Reserved) (3 q.h.)

Continuation of ACC 4310 with special emphasis on cost allocation. Covers use of cost data in decision-making and the control process. *Prereq.* ACC 4310 and 80 q.h.

ACC 4425 Auditing 1 (Reserved) (3 q.h.)

An examination of auditing concepts and standards relevant to the attest function. Includes coverage of such topics as: ethical and legal responsibilities of the auditor, internal control, and auditor reports. *Prereq.* ACC 4400 and ACC 4307 and 80 q.h.

ACC 4426 Auditing 2 (Reserved) (3 q.h.)

Continued examination of auditing concepts and standards relevant to the attest function. Includes compliance and substantive tests as they relate to specific transaction cycles and the use of statistical sampling techniques. *Prereq.* ACC 4425.

ACC 4440 Federal Income Taxes 1 (Reserved) (3 q.h.)

An in-depth study of federal tax law as it applies to individuals. In addition to a coverage of the law, tax planning concepts will be emphasized. *Prereq.* ACC 4307 and 80 q.h.

ACC 4441 Federal Income Taxes 2 (Reserved) (3 q.h.)

Continuation of ACC 4440. Property transactions, including non-taxable transactions; fundamental tax law relating to corporate formation and operation, partnerships, and S corporations. *Prereq.* ACC 4440.

AFRICAN-AMERICAN STUDIES

AFR 4131 African-American History: 1600-1900 (formerly African-American History 1) (3 q.h.)

This survey covers the development of black America from the period of slavery through Reconstruction, with emphasis on the historical links between Africa and America and their impact on black development in the United States.

AFR 4132 African-American History: Twentieth Century (formerly African-American History 2) (3 q.h.)

This course examines the development of black America from Reconstruction to the present, and the effects of events in the United States and world history on the development of black America. There is special emphasis on contemporary issues and how these issues can be seen through an historical perspective.

AFR 4151 Survey of African-American Art (3 q.h.)

Black art, like black literature, has always been an important aesthetic social statement by the African-American artist. This course offers an historical and critical examination of African-American art from the nineteenth century to the present, with special emphasis on the effects of European and African art styles on the black artist in America.

AFR 4193 Africa Today (3 q.h.)

With increasing numbers of nations striving for economic and political control in Africa, and with imperialist and colonial ideas remaining in the living memory of Africans, Africa presents a complex political and social picture to the rest of the world. This course examines some of the salient features of black art, politics, and identity in Africa.

ART AND GRAPHIC DESIGN

ART 4100 History of Art to the Fourth Century A.D. (formerly History of Art) (3 q.h.)

Survey of history of Western art from prehistoric times to the end of the Roman Empire. Includes the study of major monuments, artists, and stylistic developments that evolved during the Prehistoric, Primitive, Egyptian, Mesopotamian, Aegean, Greek, and Roman periods. Slide lectures and discussions.

ART 4101 History of Art to the Sixteenth Century (3 q.h.)

Survey of history of Western art from the end of the Roman Empire to the late sixteenth century. Includes the study of major monuments, artists, and stylistic developments that evolved during the Early Christian, Byzantine, Early Medieval, Romanesque, Gothic, Early and High Renaissance, and late sixteenth-century Mannerist periods. Slide lectures and discussions.

ART 4102 History of Art to the Twentieth Century (3 q.h.)

Survey of history of Western art from the late sixteenth century to the twentieth century. Includes the study of major monuments, artists, and stylistic developments that evolved during the Baroque and Rococo periods, and in nineteenth- and twentieth-century Europe and America. Slide lectures and discussions.

ART 4105 Art Through the Ages (3 q.h.)

Concentrated historical survey of Western art from prehistoric cave paintings to the twentieth century. Includes the study of major monuments, artists, and stylistic developments found in the Pre-Classical, Classical, Medieval, Renaissance, and Baroque periods, and in nineteenth- and twentieth-century Europe and America. Slide lectures and discussions.

ART 4106 Introduction to Art (3 q.h.)

Introduction to the language, techniques, aesthetics, and visual styles of painting, sculpture, graphic art, and architecture. Includes individual and comparative studies of major works of art in each field, discussion of terminology, and historical examination of the social, political, and cultural significance of each art form. Slide lectures and discussions.

ART 4110 Modern Art (3 q.h.)

Examination of major movements and developments in painting and sculpture from the late nineteenth century to the present. Emphasizes changing aesthetic views and the artistic, philosophical, historical, sociological, and political influences shaping those views and the modern movement as a whole. Slide lectures and discussion.

ART 4112 Visual Foundations (Studio)* (3 q.h.)

An introduction to the fundamental principles, nature, and meaning of visual organization, leading to an understanding of the concepts of two- and three-dimensional art. Topics include problems of space, balance, and formal inter-relationships as they occur in a variety of fine arts and design.

ART 4121 Principles of Drawing and Composition (Studio)* (3 q.h.)

Introduction to the fundamental principles of drawing and composition through formal graphic studies of line, shape, value, form, light, space, pattern, and texture. Stresses the use of pencil, charcoal, conte crayon, and other dry media. Slide lectures and critiques as needed.

ART 4122 Introduction to Figure Drawing (Studio)* (3 q.h.)

Introduction to drawing the human form. Includes basic studies in anatomy, proportion, negative/positive space, contour, gesture, mass, line, composition, and drawing

technique. Slide lectures, critiques, and weekly sessions drawing from the model. (*Laboratory fee.*)

ART 4123 Drawing Workshop (Studio)* (3 q.h.)

Introduction to more advanced problems in the analysis of visual language and its creative organization. Emphasizes strengthening drawing techniques and developing a personal style.

ART 4126 Landscape Painting (Studio)* (3 q.h.)

An introduction to the art of landscape painting. This course will draw upon the traditions of landscape representation in the history of art, and the creative and expressive potential of each student. Sketching and painting outdoors are treated as an integral part of the courses.

ART 4127 Basic Painting (Studio)* (3 q.h.)

Introduction to the fundamentals of painting. Includes formal studio assignments in the study of color, light, pictorial space systems, form, texture, and composition to establish a foundation for more individual, creative expression. Critiques and slide lectures as needed.

ART 4128 Intermediate Painting (Studio)* (3 q.h.)

Fundamental principles of painting, followed by more advanced studies in shape, scale, texture, brushstroke, and edge as well as color, light, form, and composition. Examines problems in a variety of stylistic approaches and techniques from the past and the present. Critiques and slide lectures as needed.

ART 4129 Painting Workshop (Studio)* (3 q.h.)

Individual development through a structured, project-oriented approach. Encourages recognition of the conceptual aspects of painting as well as the development of a personal painting style and unique visual imagery. Critiques and slide lectures as needed.

ART 4135 Design Fundamentals (Studio)* (formerly Design Foundations and Techniques) (3 q.h.)

Introduction to the basic principles of two-dimensional design including the organization of forms in two dimensional space and

the concepts of repetition, contrast symmetrical and asymmetrical composition, balance and unity. This is a studio course in which students develop their design sense in order to move on to more sophisticated problems in graphic design.

ART 4136 Basic Watercolor Painting (Studio)* (3 q.h.)

Practice and creative expression in the technical fundamentals of watercolor.

ART 4139 Color Theory and Practice (Studio)* (3 q.h.)

Exploration of the objective nature and expressive possibilities of color. Through class work and projects, students examine the major theories and laws of color, its harmonies and special characteristics as well as color psychology, symbolism, and orchestration. Students discover their intuition for color and develop its application in art and design.

ART 4140 Graphic Communication and Production (3 q.h.)

Overview of the design and production processes of printed materials. Examines the designer's role in concept development and layout and introduces reprographics, typesetting, printing and color techniques, paper, and bindery methods. The scheduling and economic factors involved in bringing a piece to print are also addressed.

ART 4141 Graphic Design 1 (Studio)* (3 q.h.)

Introduction to professional problem-solving in graphic design, including typographic and pictorial elements and their integration with verbal content to communicate ideas. Emphasis is on the fundamentals of visual thinking, concept development, and two-dimensional layout. Students gain experience with the design process from thumbnail sketches to the finished presentation. *Prereq.* ART 4135 and ART 4139.

ART 4142 Graphic Design 2 (Studio)* (3 q.h.)

Intermediate study and creative work in graphic design, with emphasis on creating overall design concepts for client presentations. Students explore effective problem-solving techniques by taking a variety of projects from concept to finished presentation. *Prereq.* ART 4141 and ART 4151.

ART 4143 Advertising Design (Studio)* (3 q.h.)

Introduction to advertising and to the language and design problems commonly met in the field. Study and creative work in advertising research analysis, layout, and preparation of client presentations. Marketing fundamentals are also addressed. *Prereq.* ART 4151 or instructor's permission. *Prereq. for Advertising Certificate students:* ART 4115.

ART 4151 Typography (3 q.h.)

The evolution of typography and its current applications. Emphasizes understanding basic typographic terms and techniques, acquiring composition skills such as copyfitting and type specification, understanding typography as symbol and as written record, exploring design concepts through typography, and learning the creative potential of new typesetting systems.

ART 4160 Basic Photography (Studio)* (3 q.h.)

Use of the camera, the negative, and the black-and-white print for the beginning student. Includes weekly shooting assignments, demonstrations, and hands-on darkroom experience. (*Laboratory fee.*)

ART 4161 Intermediate Black and White Photography (Studio)* (3 q.h.)

Continuation of ART 4160. Focuses on further practice in darkroom skills and production of clear and expressive images. (*Laboratory fee.*) *Prereq.* ART 4160.

ART 4162 Photography Workshop (Studio)* (3 q.h.)

Through close interaction with the instructor, students refine their technical skills and learn to make meaningful decisions about their relation to the world through the use of photography. Alternative processes such as infrared, toners, and large format are demonstrated and used. Contemporary trends in photography are illustrated through frequent slide presentations. (*Laboratory fee.*) *Prereq.* ART 4160 or *equiv.*

ART 4163 Introduction to Color Photography (Studio)* (3 q.h.)

Basic color theory and contemporary photographic processes and practices. Students work with color negative materials and print

*Courses designated "(Studio)" meet for 3 1/2 hours.

from color slides and negatives. Color printing facilities are provided. Lectures and critiques when appropriate. (*Laboratory fee.*) *Prereq.* ART 4160 or equiv.

ART 4164 Color Projects in Photography (Studio)* (3 q.h.)

Continuation of ART 4163. (*Laboratory fee.*) *Prereq.* ART 4163.

ART 4165 Seeing in Color (3 q.h.)

Investigates basic principles of color photography through lectures, demonstrations, and critique. Color slide film will be used, eliminating the need for lab work. Emphasis is on using color for creative personal expression. (No prereq.)

ART 4171 American Cinema (3 q.h.)

This course explores the uniquely distinguishing characteristics of American cinema. These range from such formal elements as camera angles, lighting, editing, sound, acting, narrative structure and construction of point of view. The course will also analyze such recurring concerns of American cinema as the individual and community, issues of masculinity and violence, urban alienation, uprootedness and adolescence. The directors whose work will be discussed include Michael Cimino, Martin Scorsese, Robert Altman, Francis Ford Coppola, and John Ford.

ART 4173 International Cinema (3 q.h.)

This course examines films of such diverse countries as France, Italy, Greece, India, Japan, and Argentina and shows how film style and film language are culturally based and reflect the underlying values of culture. The course also analyzes the differences in the construction of narrative and point of view in the films of the different countries. The impact of cultures with communal or extended family social structures on camera angles and sound is also examined. The directors whose work will be studied include Karel Reisz, Claude Chabrol, Luchino Visconti, Kenji Mizoguchi, and Satyajit Ray.

ART 4174 Themes in Film (3 q.h.)

This course takes one theme as its subject and explores that theme fully through films from different countries. The themes include family relationships, gender, coming of age, and war, as well as the journey/road film, the concert/music film, and the exploration of the "other" in film. The course focuses on

different portrayals of a given theme through analysis of film language such as camera angles, sound, editing, narrative structure, and construction of point of view, and how these relate the story of the film.

ART 4175 History of Graphic Design (3 q.h.)

Graphic design from the mid-nineteenth century (the Industrial Revolution) to the present, with references to earlier influences. Focuses on the evolution of the graphic design field, its nature and function, major periods and trends, and the influence of technology and society. Slide lectures and discussion.

ART 4176 International Directions in Graphic Design (3 q.h.)

Contemporary theories and practices in international graphic design. Focuses on design activities in such major industrial nations as Germany, Italy, France, England, Canada, Japan, and the United States. Case studies reflecting graphic design solutions to a variety of visual communication problems are examined. Slide lectures and discussion.

ART 4180 Macintosh Desktop Publishing (3 q.h.)*

An introduction to desktop publishing. Students will learn how to apply the basics of desktop publishing to business and corporate publications. Topics such as page layout, typography, hardware, and management issues will be discussed. Limited enrollment. *May not be used to satisfy course requirements for graphic arts certificate or degrees.*

ART 4181 Introduction to Computer Graphics (Studio)* (formerly Introduction to Computer-Aided Graphic Design) (3 q.h.) Introduction to the terminology, concepts, and applications of computer-aided graphic design. Through lectures, demonstrations, and labs, students explore the range of computer graphics applications on personal computer (DOS and MAC) systems; input and output devices; and the advantages and limitations of computers as design tools. Limited enrollment. (*Laboratory fee.*) *Prereq.* ART 4141 and ART 4151.

ART 4183 Electronic Publishing Systems (Studio)* (3 q.h.)

Designed to teach the computer novice how to apply the basics of desktop publishing

*Courses designated "(Studio)" meet for 3 1/2 hours.

software for business and corporate publications. Students will use page layout programs such as Quark Xpress or Aldus Pagemaker. Design, page-layout, typography, hardware, and management issues will be applied to actual publications and business documents. Limited enrollment. (*Laboratory fee.*) Prereq. ART 4181.

ART 4184 Presentation Graphics (Studio)* (3 q.h.)

Students will create and produce computerized slide presentations. Emphasis is placed on the selection and layout sequencing of type, visuals, and peripheral elements for word slides, graphs, charts, and illustrations to be used in corporate, educational, and advertising presentations. Limited enrollment. (*Laboratory fee.*) Prereq. ART 4181.

ART 4185 Creative Imaging: Custom Computer Design (Studio)* (3 q.h.)

Scanning and image enhancement techniques are utilized to create original visuals appropriate for advertising and publishing graphics as well as fine art. Limited enrollment. (*Laboratory fee.*) Prereq. ART 4183.

ART 4186 Computer Graphic Design Portfolio (Studio)* (3 q.h.)

Students may choose to either edit and refine a series of their best computer graphic designs or to work on a specific portfolio design project. All students will design a self-promotion piece using the layout application of their choice. (*Laboratory fee.*) Prereq. ART 4185 and 30 q.h. of computer graphic certificate courses. (Not a regularly scheduled course. Students must contact Liberal Arts Office to register to work with an instructor.)

ART 4187 Advanced Computer Illustration (Studio)* (formerly Graphic Software Studies 1) (3 q.h.)

Advanced computer illustration studies using popular vector-based drawing programs such as Adobe Illustrator, Aldus Freehand, and Corel Draw. Limited enrollment. (*Laboratory fee.*) Prereq. ART 4185.

ART 4188 Advanced Raster Graphics (Studio)* (formerly Graphic Software Studies 2) (3 q.h.)

Identification and application of pixel/raster-based paint programs such as Targa Tips, Pixel Paint, and Photoshop. Limited enrollment. (*Laboratory fee.*) Prereq. ART 4183 and ART 4185.

ART 4189 Advanced Electronic Publishing Design (Studio)* (formerly Graphic Software Studies 3) (3 q.h.)

Identification and application of pagination, layout, and design programs such as PageMaker and Quark Xpress. Limited enrollment. (*Laboratory fee.*) Prereq. ART 4187.

ART 4191 CADD-Computer-aided Design and Drafting (Studio)* (3 q.h.)

Covers both basic application of CADD relative architectural delineation and concepts of 2D design and drafting. Intended for architects and engineers interested in applying AutoCad 10.0/DOS platform. Limited enrollment. (*Laboratory fee.*) Prereq. ART 4181.

ART 4195 Introduction to Digital Imaging (Studio)* (3 q.h.)

Introduction to digital imaging for visual artists. Acquaints the beginner with the use of Adobe Photoshop® to create or manipulate photographic imagery. Weekly assignments, demonstrations, hands-on lab experience, and a final portfolio. (*Laboratory fee.*)

ART 4204 Italian Renaissance Art (3 q.h.)

Survey of Italian painting, sculpture, and architecture of the fifteenth and sixteenth centuries, with special attention to their historical, cultural, and social contexts. Considers how Renaissance ideals were reflected in the renewed interest in classical harmony and order, and in the growing self-awareness, individualism, and naturalism of the time. Covers such artists as Giotto, Donatello, Botticelli, Michelangelo, da Vinci, Raphael, and Titian.

ART 4212 Nineteenth Century Painting (3 q.h.)

A study of European painting of the nineteenth century, focusing on Neo-Classicism, Romanticism, Realism and especially Impressionism. The course emphasizes French painting, but it also considers important developments in Spain, England, and Germany.

ART 4213 Modern Painting (3 q.h.)

Developments in painting from the late nineteenth century through the early 1930s, examining major schools, movements, and artists from Post-Impressionism through Surrealism. Focuses on important shifts in painting concepts and the rise of innovative modes of expression instrumental in establishing the foundation of Modernism.

ART 4214 Contemporary Painting (3 q.h.)
Developments in painting from the early 1940s to the present, including major schools, movements, and artists. Focuses on the cultural impact of the exodus of artists from Europe to the United States prior to World War II, the meteoric rise of Abstract Expressionism, and the diversity of movements since World War II, such as Pop Art, Minimalism, Conceptual Art, and New Realism.

ART 4220 American Painting and Sculpture (3 q.h.)

American painting and sculpture from colonial times through the early 1930s. Includes the study of painting from itinerant colonial "limners" through Copley, Benjamin West, and the English tradition; the Hudson River School; Eakins, Hopper, Marin, Stella, and O'Keeffe; and the founding of American Modernist painting. Also examines sculpture from colonial gravestone reliefs through Rush, Augur, and the public monuments of French, Saint-Gaudens, and Calder.

ART 4223 American Architecture (3 q.h.)
American architecture from the Colonial period through the early 1930s. Includes the seventeenth-century Early American style, the eighteenth-century Georgian style, the Republican style, mid-nineteenth-century Revival styles, the Stick-and-Shingle styles, Richardsonianism, Sullivan and the rise of the skyscraper, and Frank Lloyd Wright.

ART 4228 Twentieth-Century Architecture (3 q.h.)

A study of the forms and principles of European and American architecture of the twentieth century, with particular emphasis on the work of such key figures as Frank Lloyd Wright, Mies van der Rohe, Le Corbusier, and Louis Kahn, and such influential movements as the Dutch de Stijl, Russian constructivism, and American post-modernism.

ART 4230 History of Photography (3 q.h.)
Developments in photography from the early daguerreotypes to the present. Includes major movements, styles, artists, and significant technological developments. Slide lectures and assigned readings.

ART 4231 Contemporary Photography (3 q.h.)

Evolution of styles and techniques in contemporary photography since World War II. Emphasis is on the variety of image-making techniques and photographic styles and concepts of the last twenty years. Slide lectures and assigned readings.

ART 4251 Portfolio Development (Studio)* (formerly Advanced Graphic Design) (3 q.h.)

Portfolio-development course for students who have successfully completed all other Graphic Design and Visual Communication certificate program requirements. Emphasis is on professional design skills and personal style. *Prereq.* ART 4151 and 27 q.h. of graphic design courses.

ART 4366 Promotional and Technical Publications: Design and Production (Studio)* (3 q.h.)

Design, production, and economics of promotional and technical publications. Using a desktop design/publishing system, students explore creative solutions in producing marketing, advertising, and sales-support publications as well as technical service manuals, operating guides, and other documentation. (*Laboratory fee.*) *Prereq.* ART 4183. *Not open to students who have taken ART 4364 or ART 4365.*

ART 4367 Pictorial Imagery for the Graphic Designer (Studio)* (formerly Illustration) (3 q.h.)

An introductory course in image conceptualization including photography and illustration. Techniques and methods covered include cropping and scaling, photo shoots and art direction, photo manipulation, research and buying original art and stock.

ART 4368 Graphic Design for Media (3 q.h.)

Surveys the expanding use of slide-tape, multi-image, and multi-media video and film in areas ranging from public relations and sales to documentary and entertainment presentations. The collaborative role of writers, producers, and art directors in the design and production of media projects, particularly audio-visual projects, is explored. *Prereq.* ART 4151.

ART 4402 Marketing Strategies for Printing and Publishing (3 q.h.)

Topics include the integrated nature of marketing; the relationship of marketing to product development; advertising, promotion, and sales; the creation of marketing support materials; and the development of an overall marketing plan and timeline.

ART 4421 Methods of Book Design (Studio)* (3 q.h.)

The basic terminology, tools, and skills of book design. Students practice drawing layouts, casting off manuscript, specifying type, and dummyping pages.

ART 4475 Graphic Arts Production Control (3 q.h.)

The techniques of managing production in commercial printing and publishing plants. Specialization vs. standardization, production forecasting and control; routing and planning; records of production; quality control; and effective use of personnel. Various production management controls of web- and sheet-fed, commercial, and publication printing are presented, analyzed, and discussed.

ART 4479 Estimating Procedures for the Graphic Arts (3 q.h.)

Basic estimation procedures and principles for single- and multi-color printing. All facets of planning the job for estimating: design and layout, typography, paper, prep and plates, presswork, binding, and finishing. Emphasis throughout is on active student participation in solving practical estimation problems.

ART 4600 Fundamentals of Publishing (3 q.h.)

An overview of the publishing industry, from the initial "why" to new trends and how they effect its future. Topics covered include: acquisitions, editorial work, design and art preparation, production and manufacture, marketing, and the importance of coordinating all functions within a publishing company.

ART 4605 Rights and Reproductions (3 q.h.)

An overview of the copyright law and subsidiary rights, including the negotiation of rights in the original contract, the role of the permissions editor, and current contract and legal issues facing writers and editors today.

ART 4810 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

ART 4811 Honors Program 2 (4 q.h.)

See ART 4810.

ART 4812 Honors Program 3 (4 q.h.)

See ART 4810.

ART 4815 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prerequisite* 87 q.h.

ART 4816 Advanced Tutorial 2 (3 q.h.)

See ART 4815.

ART 4820 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

ART 4821 Independent Study 2 (3 q.h.)

See ART 4820.

ART 4822 Independent Study 3 (3 q.h.)

See ART 4821.

ART 4823 Field Work in Art (6 q.h.)

Designed to enhance career development by allowing students to earn credit for the application of their academic backgrounds to practical problems in the work place. See page 24 for details.

AMERICAN SIGN LANGUAGE

ASL 4101 American Sign Language 1 (4 q.h.)

Introduction to American Sign Language, the language used by members of the Deaf community in the United States and parts of anglophone Canada. Focuses on conversation in signs, basic rules of grammar, and cultural aspects of the Deaf community.

*Courses designated "(Studio)" meet for 3 1/2 hours.

ASL 4102 American Sign Language 2 (4 q.h.)
Continuation of basic American Sign Language and culture study, in which students further their ability to describe and discuss everyday matters and situations in a culturally appropriate manner, using their growing sign vocabulary, more complex grammatical principles, and communicative strategies which assist in being understood by sympathetic Deaf listeners. *Prereq.* ASL 4101.

ASL 4201 Intermediate American Sign Language 1 (4 q.h.)

Focuses on further developing visual-spatial orientation and manipulation skills, sign vocabulary, and complex sentence structures. Student goals are to learn to handle most uncomplicated communications and social situations in a culturally appropriate way. *Prereq.* ASL 4102.

ASL 4202 Intermediate American Sign Language 2 (4 q.h.)

Continued work on developing a number of strategies for opening, sustaining, and closing general conversations on a range of topics; students further develop the ability to question, narrate, and give increasingly detailed descriptions of activities, interactions, plans, and directions; and understand and make themselves understood by ASL users. *Prereq.* ASL 4201.

ASL 4301 Advanced American Sign Language Proficiency 1 (4 q.h.)

Continued vocabulary building, refinement of grammatical principles, and practice of effective communicative strategies used to make oneself understood. Focuses on the structure and use of connected discourse. Students begin to converse in a clearly participatory fashion and to narrate and describe, linking sentences together smoothly. *Prereq.* ASL 4202.

ASL 4302 Advanced American Sign Language Proficiency 2 (4 q.h.)

Continuation of Advanced ASL 1. Student goal is to demonstrate the ability to initiate, sustain, and close a wide variety of communication situations, from simple to complex; to communicate facts and talk casually about topics of current public and personal interest; to discuss, narrate, and describe, linking sentences together smoothly; and to understand and be easily understood by native ASL users. *Prereq.* ASL 4301.

ASL 4410 Linguistics of American Sign Language (3 q.h.)

For skilled ASL signers. Conducted in ASL, the course is descriptive and data-oriented rather than theoretical. Includes the parts of a sign; building words in ASL; sentence structure; the meaning and issue of iconicity; organization of sentences according to old and new information; and the structure of stories. Also, grammatical features of ASL, such as classifiers, specifiers, verb modulations and aspects, and the role of facial expression. *Prereq.* ASL 4302 and ENG 4501.

ASL 4411 Deaf History (3 q.h.)

The history of Deaf people in the Western world, with emphasis on the American Deaf community, its language, education, and relations with hearing society. *Prereq.* ASL 4302 and ASL 4412.

ASL 4412 American Deaf Culture (3 q.h.)

The status of Deaf people as both a linguistic and cultural minority. Raises questions concerning the nature of signed language and its varieties, the education of Deaf people, the historical treatment of deafness, the sociological and cultural makeup of Deaf individuals. *Prereq.* ASL 4302.

ASL 4413 ASL Literature (formerly Deaf Literature) (3 q.h.)

Covers various genres of literature by and about Deaf people. Concentrates on Deaf characters and the influences Deaf culture and Deaf history have on the literary works. Includes selected works from the early 1900s to the present, including videotaped materials. *Not open to students who have taken ASL 4401. Prereq.* ASL 4302 and ASL 4412.

ASL 4415 Deaf Community Practicum (3 q.h.)

Forty hours of service in programs and agencies within the Deaf community. Biweekly seminar on issues of social and professional dynamics, empowerment, and interactions of Deaf and hearing people. *Prereq.* ASL 4302, ASL 4410, ASL 4412 and either ASL 4411 or ASL 4413.

ASL 4600 Introduction to Interpreting (formerly ASL 4501 Sign Language Interpreting I) (3 q.h.)

Overview of the field of interpretation. Emphasis is on exploring ASL-English interpretation as a career option by identifying requi-

site responsibilities, skills, and aptitudes, the process of becoming an interpreter, employment options, and current issues in the field. *Prereq.* ASL 4302, ENG 4501, ASL 4410, ASL 4412 and either ASL 4411 or ASL 4413; *co-requisite with Deaf Community Practicum.*

ASL 4601 The Interpreting Process 1
(formerly American Sign Language-English Interpreting 1) (4 q.h.)

Study of the process of interpretation, overview of theoretical models, practice of requisite skills and process tasks, application of skills and theory to the translation process. *Prereq.* ASL 4600 with a grade of "B" or better, plus a clear pass on the screening for entry.

ASL 4602 The Interpreting Process 2
(formerly American Sign Language-English Interpreting 2) (4 q.h.)

Continuation of the study of the interpretation process, including practice of requisite skills and process tasks of increased complexity. Application of process skills, contrastive cultural analysis and teaming skills to the consecutive interpretation process. *Prereq.* ASL 4601 and ASL 4609 with a grade of "B" or better.

ASL 4603 The Interpreting Process 3
(formerly American Sign Language-English Interpreting 3) (4 q.h.)

Continuation of the study of the interpretation process, including practice of requisite skills and process tasks of increased complexity, and application of process skills and contrastive group dynamics and discourse analysis to the simultaneous interpretation process. *Prereq.* ASL 4602 and ASL 4606 with a grade of "B" or better.

ASL 4604 Special Topics in Interpreting
(3 q.h.)

Exploration of various topics in the field of interpreting and/or the theory and practice of specialized work. Topics rotate and may include such topics as current professional and ethical models, health issues for interpreters, interpreting in mental health, legal, or medical settings, and interpreting for deaf-blind individuals. Students may take this course up to three times for credit, provided they focus on a different topic each time. *Prereq.* instructor's permission.

ASL 4607 Interpreting Lab (4 q.h.)

Practice in consecutive and simultaneous interpreting skills, with constructive feedback. *Prereq.* ASL 4603 with a grade of "B" or better.

ASL 4608 Practicum (4 q.h.)

Sixty hours of observation of interpreters at work in various settings serving Deaf people. Biweekly seminar focuses on linguistic and ethical questions and dilemmas. *Prereq.* All other courses in the Interpreting certificate with a grade of "B" or better; must be repeated for completion of the certificate.

ASL 4609 Contrastive Analysis for Interpreters (4 q.h.)

Study of the major linguistic features and cultural features of Deaf and non-Deaf communities. Compares and contrasts basic similarities and differences in the structures of ASL and English and the values, beliefs, and norms of the Deaf and non-Deaf communities. Primary focus is on pragmatics and discourse and on increasing students' awareness of American Deaf culture and general American culture. *Corequisite with Interpreting Process 1.* *Prereq.* ASL 4600 with a grade of "B" or better, plus a clear pass on the screening for entry.

ASL 4610 Interpreters at Work (3 q.h.)

Exploration of the day-to-day concerns of working as an interpreter, focusing on group dynamics and various populations, settings, and environmental factors, business aspects of the field, and how and when to work as a team. Focuses further attention on increasing awareness of American Deaf culture and general American culture. *Prereq.* ASL 4607 with a grade of "B" or better.

ASL 4612 Interpreter Role and Ethics
(4 q.h.)

Exploration of ethical standards and dilemmas in ASL-English interpretation through the use of discussion, hypothetical situations, and role play. Emphasis is on values, ethics, and morality; professional principles: power, responsibility, and group dynamics; and the decision-making process. *Prereq.* ASL 4601 with a grade of "B" or better.

ASL 4801 Advanced Tutorial in ASL 1
(4 q.h.)

Opportunity for qualified students to take a required upper-level ASL course as a tutorial when it is not available in the usual format. See page 24 for details.

ASL 4802 Advanced Tutorial in ASL 2
(4 q.h.)

See ASL 4801.

ASL 4803 Independent Study 1 (3 q.h.)
Opportunity to undertake special research.
See page 24 for details.

ASL 4804 Independent Study 2 (3 q.h.)
See ASL 4803.

ASL 4805 Independent Study 3 (3 q.h.)
See ASL 4803.

BIOLOGY

(See **Biotechnology** for additional BIO course selections)

BIO 4107 Biology 1 (Principles) (formerly BIO 4103) (3 q.h.)

This course provides an introduction to a variety of biological concepts. Plant and animal characteristics are surveyed through comparisons of cell structure and function. Specific topics include: Cytology, Histology, Physiology, Genetics, Cellular respiration, and Botany. *The required laboratory is BIO 4110, Lab for Biology 1. (1 q.h.) (Laboratory fee.)*

BIO 4108 Biology 2 (Diversity) (formerly BIO 4104) (3 q.h.)

Experience the diversity of life through a systematic survey of organisms. Beginning with unicellular algae, this course follows the major evolutionary trends leading to complex forms. Specific elements of structure, function, and natural history will be examined. *The required laboratory is BIO 4111, Lab for Biology 2. (1 q.h.) (Laboratory fee.) Prereq. BIO 4107 or equiv.*

BIO 4109 Biology 3 (Animal) (formerly BIO 4105) (3 q.h.)

This course provides an introduction to basic animal structure and function. The anatomy of each body system is described. Physiological processes such as hormonal control, nerve impulse transmission, muscular contraction, and the immune response are introduced. *The required laboratory is BIO 4112, Lab for Biology 3. (1 q.h.) (Laboratory fee.) Prereq. BIO 4107, BIO 4108 or equiv.*

BIO 4125 Biology of AIDS (3 q.h.)

This course will explore the biological aspects of AIDS in order to understand the complexities inherent in finding a cure. Topics include: the origins of the disease; the destruction of the immune system; factors

influencing the pathogenesis of HIV in AIDS and modes of transmission. The epidemiology and projected spread as well as the medical aspects of current treatment modalities will be discussed.

BIO 4161 Human Anatomy and Physiology 1 (formerly BIO 4175) (3 q.h.)

Topics include terminology and basic gross organization of the body, functional anatomy of the musculoskeletal system and an overview of the thoracic and abdominal viscera. The laboratory is concerned with the study of the human skeleton and appropriate dissections. *The required laboratory is BIO 4165, Lab for Human Anatomy and Physiology 1. (1 q.h.) (Laboratory fee.) Although there is no prereq., prior coursework in general biology is recommended.*

BIO 4162 Human Anatomy and Physiology 2 (formerly BIO 4176) (3 q.h.)

Properties of cell membranes; functional anatomy and physiology of the nervous system; special senses; endocrinology. The laboratory includes membrane physiology, gross and microscopic anatomy of the nervous and endocrine system and testing of somatic and special senses. *The required laboratory is BIO 4166, Lab for Human Anatomy and Physiology 2. (1 q.h.) (Laboratory fee.) Prereq. BIO 4161 or equivalent is recommended.*

BIO 4163 Human Anatomy and Physiology 3 (formerly BIO 4177) (3 q.h.)

Anatomy and physiology of the respiratory, cardiovascular, digestive, urinary, and reproductive systems; fetal development. The laboratory deals with the anatomy and physiology of these systems. Demonstration material is presented for the study of the reproductive system and its development. *The required laboratory is BIO 4167, Lab for Human Anatomy and Physiology 3. (1 q.h.) (Laboratory fee.) Prereq. BIO 4162 or equiv.*

BIO 4207 Microbiology 1 (formerly BIO 4190) (2 q.h.)

Morphology and biochemistry of bacteria. *The required laboratory is BIO 4210, Lab for Microbiology 1. (1 q.h.) (Laboratory fee.) Prereq. BIO 4109 or equiv.*

BIO 4208 Microbiology 2 (formerly BIO 4191) (2 q.h.)

Survey of pathogenic microorganisms. *The required laboratory is BIO 4211, Lab for Microbiology 2. (1 q.h.) (Laboratory fee.) Prereq. BIO 4207 or equiv.*

BIO 4209 Microbiology 3 (formerly BIO 4192)(2 q.h.)

Examination of the characteristics and role of microorganisms in the environment. *The required laboratory is BIO 4212, Lab for Microbiology 3.* (1 q.h.) (Laboratory fee.) Prereq. BIO 4208 or equiv.

BIO 4215 Anatomy and Physiology A (formerly BIO 4178) (3 q.h.) (Registration restricted to paramedic students.)

Human anatomy and physiology. Describes the cell and its physiology, the structure of tissues, the anatomy and physiology of the cardiovascular system and blood, the respiratory system, and the urinary system. *The required laboratory is BIO 4217, Lab for Anatomy and Physiology A.* (1 q.h.) BIO 4215 and BIO 4216 may not be substituted for BIO 4161, 4162, 4163.

BIO 4216 Anatomy and Physiology B (formerly BIO 4179) (3 q.h.) (Registration restricted to paramedic students.)

Continuation of BIO 4215. Describes the anatomy and physiology of the nervous system, skeletomuscular system, digestive system, endocrine and reproductive systems. *The required laboratory is BIO 4218, Lab for Anatomy and Physiology B.* (1 q.h.) Prereq. BIO 4215. BIO 4215 and BIO 4216 may not be substituted for BIO 4161, 4162 and 4163.

BIO 4224 Ecology 1 (3 q.h.)

Introduction to the concept of limiting factors, biogeochemical cycles, trophic levels and energy transfer and their relationship to the structure and function of populations, species, communities and ecosystems. Prereq. *Knowledge of General Biology.*

BIO 4225 Ecology 2 (3 q.h.)

Principles applied to aquatic systems with special references to physicochemical factors, typical habitats and communities. Eutrophication and toxic chemical groundwater pollution, as well as air pollution, the greenhouse effect and ozone depletion are considered. Prereq. BIO 4224 or equiv.

BIO 4226 Ecology 3 (3 q.h.)

Fundamentals of pests, pest control and pesticides. Study of wild plant, animal, energy, mineral and land resources with an introduction to the economics and politics of the environment. Prereq. BIO 4225 or equiv.

BIO 4235 Genetics 1 (3 q.h.)

Topics include nucleic acid structure, replication of genetic materials, mitosis, meiosis, and Mendelian inheritance. Prereq. BIO 4107.

BIO 4236 Genetics 2 (3 q.h.)

Examination of mutation, regulation of gene expression, population genetics, engineering, and genetics of bacteria and viruses. Prereq. BIO 4235.

BIO 4237 Genetics Laboratory (2 q.h.) Laboratory exercises involving principles of Mendelian inheritance, linkage, and crossing-over. Classical genetics utilizing *Drosophila*; biochemical studies utilizing *Neurospora* and *E. coli*. (Laboratory fee.) Prereq. BIO 4236 or equiv.

BIO 4246 Cell Biology 1 (3 q.h.)

Chemical composition, structure of cells and organelles, transport processes, cell motion and excitability, and growth. Prereq. BIO 4107, and CHM 4135 or equiv.

BIO 4247 Cell Biology 2 (3 q.h.)

Cellular energy supply, enzyme function, respiration and metabolism, photosynthesis and other synthetic pathways, and control of cellular processes. Prereq. BIO 4246 or equiv.

BIO 4248 Cell Biology Laboratory (2 q.h.)

Laboratory techniques in cell biology, microscopy, structure and chemical composition of cells, enzyme measurements, photosynthesis, respiration, active transport, and growth. (Laboratory fee.) Prereq. BIO 4247 or equiv.

BIO 4258 Advanced Human Physiology 1 (3 q.h.)

Study of human physiology emphasizing cellular processes and underlying organ functions and the interactions and control of organ systems. Selected physiological topics are considered as time allows. Prereq. *General Biology or permission of the instructor.*

BIO 4259 Advanced Human Physiology 2 (3 q.h.)

Cardiovascular considerations; the immune system; the AIDS problem; biological control mechanisms; selected endocrine topics. Prereq. BIO 4258.

BIO 4300 Computer Applications in Science (3 q.h.) (Summer Quarter only)

Research science stands to gain from various programming applications specifically geared towards its needs. A scientist faced

with a problem requiring repeated calculations must decide whether to purchase a software package, if available, to be used by specifying the parameters to fit a particular problem or to write a specific program that is completely tailored to his/her research area. Both cases require the scientist to know about computer systems and programming. This course introduces students to mainframe VAX/VMSBASIC, and covers programming techniques suited to solving scientific problems. It is designed to cover topic areas appropriate for an introductory course on various program applications in science. *Prereq.* experience with computers.

BIO 4331 Medical Microbiology (formerly BIO 4320) (3 q.h.) (Summer Quarter only) Major characteristics of disease-producing organisms. *The required laboratory is BIO 4332, Lab for Medical Microbiology. (1 q.h.) (Laboratory fee.)* Generally meets on a different night. *Prereq.* BIO 4209 or professional laboratory experience in bacteriology.

BIO 4387 Histology 1 (formerly BIO 4374) (2 q.h.) Examination of cell structure and tissue organization, including epithelium, muscle, and connective tissue. Also covers cartilage, bone, and nervous system. *The required laboratory is BIO 4391, Lab for Histology 1. (1 q.h.) (Laboratory fee.)* *Prereq.* BIO 4161 or permission of instructor.

BIO 4388 Histology 2 (formerly BIO 4375) (2 q.h.) Examination of the brain, blood, skin, cardiovascular and lymphatic systems, as well as the gastrointestinal system, including the oral cavity, GI tract, liver, and gall bladder. *The required laboratory is BIO 4392, Lab for Histology 2. (1 q.h.) (Laboratory fee.)* *Prereq.* BIO 4387 or permission of instructor.

BIO 4389 Histology 3 (formerly BIO 4376) (2 q.h.) Examination of the respiratory, urinary, and male and female reproductive systems, as well as the endocrine glands and the eyes and ears. *The required laboratory is BIO 4393, Lab for Histology 3. (1 q.h.) (Laboratory fee.)* *Prereq.* BIO 4388 or permission of instructor.

BIO 4425 Endocrinology (3 q.h.) Organization of the human endocrine system and the mechanisms of action of the

secreted hormones will be reviewed. The course will emphasize the role of the endocrine system in the integration of human physiology. Physiological disorders associated with abnormal endocrine function will be discussed. *Prereq.* BIO 4163 or equiv.

BIO 4452 Parasitology (formerly BIO 4441) (3 q.h.) (Spring Quarter only) Parasitic organisms, particularly those affecting humans and domestic animals, and their life cycles, modes of transmission, and diagnosis and treatment. Includes microscopic examination of prepared and live material. *The required laboratory is BIO 4453, Lab for Parasitology. (1 q.h.) (Laboratory fee.)* *Prereq.* BIO 4107 or instructor's permission.

BIO 4603 Scanning Electron Microscopy (formerly BIO 4600) (3 q.h.) Designed for laboratory personnel in the life sciences, medical, and biotechnology fields with no formal training in electron microscopy. This course offers practical, comprehensive instruction in the theory and practice of scanning electron microscopy (SEM). Topics to be covered include: design and operation of the SEM; beam/specimen interactions; applications of SEM in sciences and industry; and current advances in SEM technology. Laboratory exercises will provide a working knowledge of specimen preparation through basic photographic, darkroom procedures and the publication of quality electron micrographs. *(Laboratory fee.)* *Class limited to 12 students.* *Prereq.* Laboratory experience.

BIO 4604 Transmission Electron Microscopy (formerly BIO 4601) (3 q.h.) Designed for laboratory personnel in the sciences, medical, and biotechnical fields with no formal training in electron microscopy. This course offers practical, comprehensive instruction in the theory and practice of transmission electron microscopy (TEM). Topics to be covered include: design and operation of the TEM; electron optics; quantitative and localization techniques; and electron micrograph interpretation. Laboratory exercises will emphasize routine specimen preparation, TEM operation and maintenance and production of electron micrographs. *(Laboratory fee.)* *Limited to 12 students.* *Prereq.* Laboratory experience.

BIO 4605 Principles of Light Microscopy and Histotechnique (formerly BIO 4602) (3 q.h.)

This course is designed to instruct life science, medical, and biotechnology students in the fundamental principles of light microscopy, and its application in biological research. The framework of this course will involve a standard histological approach to specimen preparation, including: chemical fixation, paraffin embedding, sectioning and staining. Upon this framework more specialized techniques such as cryo-sectioning and fluorescence microscopy will be introduced. Finally the student will be exposed to advanced techniques and emerging technologies in light microscopy. (*Laboratory fee.*) *Prereq.* Laboratory experience.

BIO 4700 Advanced Tutorial 1 (4 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

BIO 4701 Advanced Tutorial 2 (3 q.h.)

See BIO 4700.

BIO 4801 Independent Study 1 (4 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h. and 3.0 q.p.a.

BIO 4802 Independent Study 2 (3 q.h.)

See BIO 4801.

BIOTECHNOLOGY

(See BIO, CHM and HSC for additional course selections)

BIO 4260 Cell, Tissue and Organ Culture (3 q.h.)

General principles and technique of tissue culture and preservation. The behavior of cells in culture, cell lines and relevant media are discussed. Methodology of animal and plant culture and its use in virology, cancer research and radiobiology. *Prereq.* Cell Biology or permission of instructor.

BIO 4455 Introduction to Biotechnology (3 q.h.)

Examines the historical development, basic technologies, and commercial potential of biotechnology. Basic biological concepts are first reviewed including the steps leading to the 20th century revolution in molecular and

cell biology. The technology of recombinant DNA, monoclonal antibody production, and nucleic acid probe development are outlined along with their therapeutic, diagnostic, and experimental uses. Newer, emerging technologies and applications are discussed where appropriate. The commercial state-of-the-art and its developmental marketing problems are included. *Prereq.* one year each, college-level biology and chemistry, or permission of instructor.

BIO 4461 Immunology (4 q.h.)

Biological, chemical, and physical attributes of antigens and antibodies, together with their serological interactions. *Presentation of the material will be by lecture and demonstration.* *Prereq.* one year each college-level biology and chemistry, or permission of instructor.

BIO 4501 Development of New Virus Vaccines (3 q.h.)

Biological and molecular properties of viruses are integrated with recombinant DNA technology to probe current strategies in viral vaccine development. The genomic organization, virion structure and viral pathogenesis of medically relevant diseases will be discussed. Material is presented on the basis of specific examples from current literature. Emphasis on factual knowledge coupled with an understanding of experimental design and data analysis. *Prereq.* BIO 4107 or instructor's permission.

BIO 4510 Introduction to Immunodiagnostics (3 q.h.)

Fundamentals of immunodiagnostics with emphasis on the application of principles to nursing, medical laboratory science, and biology. *Prereq.* one year each college-level biology and chemistry, or instructor's permission.

BIO 4511 Introduction to Recombinant DNA Technology (3 q.h.)

Principles of gene manipulation in bacteria and yeasts. Principles and methods of gene cloning and splicing. *Prereq.* one year each college-level biology and chemistry, or instructor's permission.

BIO 4512 Biomolecular Separation (3 q.h.)

Principles and practice of affinity chromatography as utilized in separation and purification of biomolecules. *The required laboratory is BIO 4515, Lab for Biomolecular Separations (1 q.h.). (Laboratory fee.) Prereq.* CHM 4253 or equiv.

BIO 4700 Advanced Tutorial 1 (4 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

BIO 4701 Advanced Tutorial 2 (3 q.h.)

See BIO 4700.

BIO 4801 Independent Study 1 (4 q.h.)

Opportunity to do an independent research project. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

BUSINESS LAW

BL 4101 Law 1 (3 q.h.)

Introduction to the legal system. Study of the nature, formation, and essential elements of contracts, including performance and remedies for breach. Also covers agency law, including the rights and duties of principal and agent, the scope of authority, and relationships to third persons.

BL 4102 Law 2 (3 q.h.)

Sales as governed by the Uniform Commercial Code, including the law of warranty, business organizations, partnerships, corporations, and other important business forms. *Prereq.* BL 4101.

BL 4105 Law (Intensive) (6 q.h.)

Same as BL 4101 and BL 4102.

BL 4106 Advanced Business Law (3 q.h.)

A study of legal topics of current importance in business law. The legal concerns of the start-up entrepreneur, wrongful termination of employment, bankruptcy problems and other selected topics. Independent study will be encouraged. *Prereq.* BL 4102.

BL 4120 Law for Personal Planning (3 q.h.)

Legal aspects of personal and family planning, including consumer rights, wills and estate planning, marital law, real estate purchase, tenants' rights, and other selected topics of interest.

BL 4314 Computer Law (3 q.h.)

Study of legal issues involving computers; including acquisition of software and hardware, proprietary rights and licenses, rights of privacy, computer crimes and other relevant topics.

BL 4315 The Business of Sports Law (3 q.h.)

This course examines contracts, the legal system and intercollegiate athletics. Topics include intercollegiate athletic opportunities for women and sex discrimination, television and the media in sports, issues in turning professional, drug testing, trademark law and legal considerations involving violence, gambling, taxes and anti-trust law.

BL 4316 International Business Law (3 q.h.)

Surveys the leading principles in international business law as applied in decisions of domestic and international courts; the sources, development and authority of international business law, such as the laws of the European Common Market; and the making, interpretation and enforcement of treaties, and the organization and jurisdiction of international tribunals.

CAREER DEVELOPMENT

CD 4100 Managing Career Decisions (formerly INT 4110) (3 q.h.)

Understand the importance of taking control of one's life and career decisions. Students complete a self-assessment including an evaluation of skills and competencies, values, interests, and personal style. Students explore a variety of career options both through library and field research. Emphasis on decision-making, goal setting, and implementing career and educational plans. Overview of job campaign includes introduction to resume preparation, network development, and interviewing techniques. (*Note:* CD 4102, CD 4103 and CD 4104 combined are equivalent to CD 4100).

CD 4102 Career Decision Making (formerly INT 4114) (1 q.h.)

For students who are unclear about career direction. A day-long session intended to help students develop self-understanding which is the basis of sound career decisions. Through individual and group activities participants will identify their skills and interests, and address personality and lifestyle preferences. Students will be introduced to a decision-making model and given an opportunity to develop a preliminary action plan by identifying next steps for themselves in the career development process.

CD 4103 Exploring Career and Market Trends (1 q.h.)

Provides an overview of the workplace and current market trends and introduces students to resources for researching economic indicators and occupational alternatives. Informational interviewing will be presented and students will have an opportunity to practice interviewing skills. Students will complete library research on one economic trend and one career alternative and conduct informational interviews in a career area of interest to them.

CD 4104 Career Planning/Self-Marketing (formerly INT 4112) (1 q.h.)

For students who are clear about direction and preparing for a job search campaign. A day-long session intended to help students develop effective strategies for job searching in today's market. Particular attention will be given to developing and using a network of professional contacts. On-line job search resources will also be highlighted. Job search correspondence, including resumes and cover letters, will be reviewed. Interviewing skills will be covered, with special attention given to preparing for interviews, handling difficult questions, and negotiating salary and benefits. Finally, students will set realistic goals for their job search and develop an action plan to meet those goals.

CD 4105 Succeeding in the Workplace (1 q.h.)

This course will provide information on the cultures and changing expectations of organizations and techniques for evaluating work environments. Aimed at students who have successfully landed a new job, the course will address appropriate behaviors for professionals in the workplace. Topics of discussion will include building relationships with your boss and colleagues, developing an entrepreneurial spirit and customer orientation, and establishing credibility. Building skills in team collaboration, communication, and problem-solving will be emphasized.

CD 4112 Building An International Career (1 q.h.)

Provides an overview of the world market place, the most typical patterns of building an international career, the main employ-

ment sectors and the essentials in approaching the job market in other countries. Emphasis will be placed on thorough research techniques plus strategies for effective networking. Students will conduct independent research, including informational interviews, and will write a report to demonstrate the research process and to summarize at least one viable plan of action that targets a specific industry in another country.

CD 4114 Exploring Entrepreneurship (formerly Topics in Business) (1 q.h.)

Starting and operating a cart business is examined as a model for small business start-up. Topics will include: determining what product to sell, choosing a location, negotiating a lease, hiring staff, licensing, and marketing. Participants will be introduced to the business plan and its importance in the success of a business. Students will develop an action plan for pursuing a business opportunity.

CHEMISTRY**CHM 4133 Chemical Principles 1 (formerly CHM 4130) 3 q.h.)**

Fundamental chemistry concepts, such as symbols, formulas, equations, atomic weights, and calculations based on equations. Also covers gases, liquids, solutions, and ionization. Examples and problems are used to develop these concepts. *The required laboratory is CHM 4140, Lab for Chemical Principles 1. (1 q.h.) (Laboratory fee.) Prereq. MTH 4108 or MTH 4112 or equiv. (can be taken concurrently).*

CHM 4134 Chemical Principles 2 (formerly CHM 4131) (3 q.h.)

Atomic structure, bonding, molecular structure, oxidation and reduction reactions, and equilibrium and kinetics. Examples and problems are used to develop these concepts. *The required laboratory is CHM 4141, Lab for Chemical Principles 2. (1 q.h.) (Laboratory fee.) Prereq. CHM 4133 or equiv.*

CHM 4135 Chemical Principles 3 (formerly CHM 4132) (3 q.h.)

Thermochemistry and electrochemistry, acids, bases, and solubility products, nuclear chemistry, introductory organic chemistry, and biochemistry. Examples and problems

are used to develop these concepts. *The required laboratory is CHM 4142, Lab for Chemical Principles 3. (1 q.h.) (Laboratory fee.) Prereq. CHM 4134 or equiv.*

CHM 4230 Analytical Chemistry 1 (formerly CHM 4221) (2 q.h.)

Principles of gravimetric and titrimetric analysis (wet chemistry). Introduces statistics as applied to analytical chemistry and examines such topics as chemical equilibrium and acid-base equilibria in simple and complex systems. Gravimetric and titrimetric experiments are performed. *The required laboratory is CHM 4234, Lab for Analytical Chemistry 1. (1 q.h.) (Laboratory fee.) Prereq. CHM 4135 or equiv.*

CHM 4231 Analytical Chemistry 2 (formerly CHM 4222) (2 q.h.)

Continuation of CHM 4230. Covers complex formation titration, precipitation titrations, and oxidation-reduction titrations. Electrical methods of analysis, such as potentiometry, electrolysis, coulometry, and polarography, are discussed and titrimetric analyses and experiments involving electricity are performed. *The required laboratory is CHM 4235, Lab for Analytical Chemistry 2. (1 q.h.) (Laboratory fee.) Prereq. CHM 4230 or equiv.*

CHM 4232 Analytical Chemistry 3 (formerly CHM 4223) (2 q.h.)

Spectrophotometry as a method of analysis, including ultraviolet, visible, infrared, and fluorescence methods; flame emission; and atomic absorption. Studies of solvent extractions and chromatographic methods of separation, such as gas-liquid chromatography and liquid chromatography. *The required laboratory is CHM 4236, Lab for Analytical Chemistry 3. (1 q.h.) (Laboratory fee.) Prereq. CHM 4231 or equiv.*

CHM 4233 Analytical Chemistry (formerly CHM 4224) (3 q.h.) (Summer Quarter only)

Principles and theories of volumetric, gravimetric, and instrumental analysis. Includes selected topics from CHM 4230, CHM 4231 and CHM 4232. Application made in the laboratory with analyses of unknown samples. *The required laboratory is CHM 4237, Lab for Analytical Chemistry. (1 q.h.) (Laboratory fee.) Prereq. CHM 4135 or equiv.*

CHM 4251 Organic Chemistry 1 (formerly CHM 4261) (3 q.h.)

Nature of carbon in organic compounds. General principles of structure, nomenclature, preparation, uses, and reactions of aliphatic hydrocarbons: alkanes, alkenes, alkynes, dienes, cycloalkanes. Position and geometric isomerism. Introduces free radical and ionic mechanisms of reactions. The laboratory generally deals with the preparation and properties of compounds discussed in the lecture. *The required laboratory is CHM 4254, Lab for Organic Chemistry 1. (1 q.h.) (Laboratory fee.) Prereq. CHM 4135 or equiv.*

CHM 4252 Organic Chemistry 2 (formerly CHM 4262) (3 q.h.)

Structure of benzene, electrophilic aromatic substitution reactions. General principles of structure, nomenclature, preparation, uses, and reactions of the various types of organic compounds, including alcohols, alkyl and aryl halides, ethers and epoxides, and carboxylic acids. Also covers optical isomerism and introductory chemical kinetics. The laboratory generally deals with the preparation and properties of compounds discussed. *The required laboratory is CHM 4255, Lab for Organic Chemistry 2. (1 q.h.) (Laboratory fee.) Prereq. CHM 4251 or equiv.*

CHM 4253 Organic Chemistry 3 (formerly CHM 4263) (3 q.h.)

Continuation of CHM 4252. Emphasizes the application of chemical conversions to synthetic problems. Includes functional derivatives of carboxylic acids, sulfonic acids and their derivatives, amines, diazonium compounds, phenols, aldehydes, and ketones. The laboratory generally deals with the preparation and properties of compounds discussed. *The required laboratory is CHM 4256 Lab for Organic Chemistry 3. (1 q.h.) (Laboratory fee.) Prereq. CHM 4252 or equiv.*

CHM 4321 Instrumental Analysis 1 (3 q.h.)

Basic theory of electrochemistry and electrochemical methods of analysis, including electrode and cell potentials, potentiometric titrations, direct potentiometry (pH meters

and specification electrodes), coulometry, voltametry, polarography, electrogravimetry, and conductometric methods. *Prereq.* CHM 4232 or equiv. (This course may serve as preparation for certain graduate courses.)

CHM 4322 Instrumental Analysis 2 (3 q.h.) Basic theory of absorption and emission spectroscopy, including ultraviolet and visible spectroscopy, molecular fluorescence and phosphorescence, atomic absorption spectroscopy (flame, arc, spark, and plasma), and infrared and X-ray spectroscopy. *Prereq.* CHM 4321 or equiv. (This course may serve as preparation for certain graduate courses.)

CHM 4323 Instrumental Analysis 3 (formerly Radiochemistry) (3 q.h.) Topics covered include: x-ray spectroscopy, radiochemical methods, and chromatographic separations. Chromatographic separations include: chromatography, high performance liquid chromatography and planar chromatography. *Prereq.* CHM 4322 or equiv. (This course may serve as preparation for certain graduate courses.)

CHM 4371 Biochemistry 1 (3 q.h.) Cellular organization, pH buffers; the biochemistry of amino acids, proteins, enzymes, and vitamins. *Prereq.* CHM 4253 or equiv.

CHM 4372 Biochemistry 2 (3 q.h.) Biochemistry of carbohydrates, lipids, and nucleic acids; bioenergetics; metabolism of carbohydrates. *Prereq.* CHM 4371 or equiv.

CHM 4373 Biochemistry 3 (3 q.h.) Metabolism of lipids, amino acids, and nucleotides and the biosynthesis of proteins, DNA, and RNA. *Prereq.* CHM 4372 or equiv.

CHM 4381 Physical Chemistry 1 (3 q.h.) Thermodynamics, thermochemistry, First and Second Laws, entropy, and free energy in spontaneous processes. *Prereq.* CHM 4133 or MTH 4112 or equiv.

CHM 4382 Physical Chemistry 2 (3 q.h.) Chemical equilibria, acids and bases, electrochemistry, colligative properties, phase diagrams, thermodynamics of multicomponent systems, and kinetic molecular theory. *Prereq.* CHM 4381 or equiv.

CHM 4383 Physical Chemistry 3 (3 q.h.) Kinetics, quantum chemistry, and photochemistry. *Prereq.* CHM 4382 or equiv.

CHM 4700 Advanced Tutorial 1 (4 q.h.) Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

CHM 4701 Advanced Tutorial 2 (3 q.h.) See CHM 4700.

CHM 4801 Independent Study 1 (3 q.h.) Opportunity to take special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

CRIMINAL JUSTICE

CJ 4101 Administration of Criminal Justice (3 q.h.)

Survey of the contemporary criminal justice system from initial contact with the offender through prosecution, disposition, incarceration, and release to the community. Emphasis on major systems of social control: police, corrections, juvenile justice, mental health systems, and their policies and practices relative to the offender. Legal, empirical, and sociological materials covered.

CJ 4103 Criminology 1 (3 q.h.)

Classical and contemporary criminological theories. Examines their historical development and empirical bases, as well as their significance to the criminal justice process and the rehabilitation/deterrence/punishment of offenders.

CJ 4104 Criminology 2 (formerly Dimensions of Crime) (3 q.h.)

Examination of empirical knowledge about the crime problem in the United States, characteristics of criminals and victims, information about dangerous repeat offenders, and financial costs of crime. Assessment of crime measurement techniques, especially the Uniform Crime Reports and victimization surveys.

CJ 4108 Criminal Law and Procedure 1 (3 q.h.)

Examination of concepts, responsibilities, and liabilities of criminal law and procedure. Topics include basic definitions, evolution of the criminal law system, analysis of substantive criminal law and the procedural process, and interaction between federal and state constitutions. *Prereq.* CJ 4115.

CJ 4109 Criminal Law and Procedure 2 (3 q.h.)

Application of constitutional and statutory concepts including statutory crimes, law of arrest, right to counsel, search and seizure, and applicable criminal procedures. Basic concepts and changing interpretations will be covered. *Prereq.* CJ 4108.

CJ 4110 Constitutional Law (3 q.h.)

History and development of the U.S. Constitution using commentary and case analysis. Topics include the Commerce Clause, procedural due process, state's rights, individual rights and civil liberties, the concept of federal supremacy, and state constitutions. *Prereq.* CJ 4115.

CJ 4114 Introduction to Law 1 (3 q.h.)

Introduction to the legal system of the United States. Presents basic principles of law, an overview of the traditional structure, the legal process, and the private and public law system.

CJ 4115 Introduction to Law 2 (3 q.h.)

Continuation of CJ 4114. Introduces basic tort and contract principles, administrative law, governmental regulation of business, and topics of concern to criminal justice professionals and students in legal studies. *Prereq.* CJ 4114.

CJ 4118 Juvenile Law (3 q.h.)

Fundamental case law and theory. Topics include care and protection cases (commonly called abuse and neglect), delinquency proceedings, status offense cases, and transfer/waiver cases. *Prereq.* CJ 4115.

CJ 4201 Criminal Investigation 1 (3 q.h.)

Evolution of contemporary investigative techniques and study of investigative effectiveness and organization in crimes such as arson, sexual offenses, larceny, burglary, robbery, forgery, and homicide. Discusses available sources of information and effective interviewing and interrogation techniques.

CJ 4202 Criminal Investigation 2 (3 q.h.)

Continuation of Criminal Investigation 1. Focuses on staffing the investigation unit, information management, establishment of investigative priorities, fiscal restraints, the relationship of criminal investigation to patrol and special units, and crime scene searches including the collection, preservation, and laboratory examination of evidence. Examines special operations such as elec-

tronic surveillance, raids, and undercover operations; affidavit construction, court preparation and testimony and the use of scientific methods. Studies those federal laws dealing with due process and other constitutional protections. *Prereq.* CJ 4201.

CJ 4203 Criminalistics 1 (3 q.h.)

Survey of the elements of microscopy, spectroscopy, and basic chemistry as they apply to the study of materials that comprise physical evidence. Covers the procedures for searching, sketching, and photographing crime scenes as well as the recognition, collection, marking, and handling of physical evidence, emphasizing the importance of maintaining the integrity of each sample. Studies the types of analysis, their value and limitations with regard to glass, soil, hairs and fibers, firearms, toolmarks, and questioned documents.

CJ 4204 Criminalistics 2 (3 q.h.)

An introduction to the analysis of biological items of physical evidence collected at the scene of the crime or submitted for laboratory examination, and to the fields of serology and toxicology. Covers methods of collecting samples and the value of blood distribution patterns, as well as laboratory techniques used to identify and characterize blood stains and other body fluids. Pharmacology and toxicology of medical and chemical substances having potential for misuse and abuse are studied. *Prereq.* CJ 4203.

CJ 4205 Patrol Theory and Administration 1 (3 q.h.)

Evolution of patrol practices, patrol function, management and supervision. Topics will include development of preventive patrol and rapid response, theories of patrol allocation, influence of operations research, and the development of community relations as an adjunct to patrol.

CJ 4206 Patrol Theory and Administration 2 (3 q.h.)

Contemporary patrol developments and functioning: directed patrol, team and community policing, the re-emergence of foot patrol, the legacy of community relations; neighborhood beat construction, patrol management and supervision; and current patrol research. *Prereq.* CJ 4205.

CJ 4207 Comparative Police Systems
(3 q.h.)

Study of police systems in Anglo-Saxon, Continental, Asian, Russian, African, and other cultural traditions. Focuses on influence of nineteenth-century English and twentieth-century American police traditions on policing systems.

CJ 4209 Police Management 1 (3 q.h.)

Introduction to the philosophy and theories of management in policing. Topics include historical development of "professional/bureaucratic" managerial approach, development of organizational strategy, managing the external environment within which police operate.

CJ 4210 Police Management 2 (3 q.h.)

Internal management of police organizations: policy development, implementation, maintenance of ongoing operations, and evaluation of program outcomes.

CJ 4214 Police and Society (3 q.h.)

The role and function of police with regard to contemporary social problems including drugs, prostitution, domestic violence, gangs, serial murderers, dangerous offenders, and illegal aliens. Course examines police interactions with individuals and groups and police responsibility in areas of civil rights and civil disorders. *Not open to those who have taken CJ 4211 or 4212.*

CJ 4301 American Correctional System
(3 q.h.)

Overview and critical analysis of correctional system emphasizing interrelatedness of all aspects of corrections. Topics include historical developments, policy analysis, decision making, the range of treatment/punishment options available including probation and parole. Current correctional philosophy and treatment approaches on federal, state, and local levels are assessed.

CJ 4302 Correctional Administration 1
(3 q.h.)

Intensive examination of American correctional process including services, standards and methods of service delivery. Topics include personnel administration and management, allocation of resources, staff development, motivation, productivity and accountability, and the role of community outreach programs and volunteer services. *Prereq. CJ 4301.*

CJ 4303 Correctional Administration 2
(3 q.h.)

Continuation of CJ 4302 with focus on problems facing correctional administrators. Topics include institutional management of offenders with special needs (dangerous/violent inmates, substance abusers, illegal immigrants, female offenders), management and control of prison violence, and preventive techniques and programs. *Prereq. CJ 4302.*

CJ 4304 Jail Administration and Management (3 q.h.)

Study of local adult correctional institutions ranging from police lock-ups to jails and houses of corrections. Topics include administrative, management, and security issues; intake, regional, and network approaches; local versus state control; offender classification, programs, residential care, inspection, and standards; pretrial detention; staffing patterns; interface with courts and law enforcement; release programs; emergency management; and suicide prevention.

CJ 4305 Case Management and Correctional Services (3 q.h.)

Overview of treatment and rehabilitative work in jail and prison environments. Topics include basic counseling concepts and techniques, individual and group therapy, institutional services, and assessment of fiscal and personnel requirements of innovative approaches. *Prereq. CJ 4301.*

CJ 4310 Community Corrections (3 q.h.)

Historical, philosophical, and pragmatic view of community corrections, analysis of alternatives to imprisonment or institutionalization. Topics include work and study release programs, family visiting furloughs, control and surveillance issues, cost effectiveness, community safety, managerial issues, residential/nonresidential programs, community resources, and volunteer involvement. *Prereq. CJ 4301.*

CJ 4311 Probation and Parole (3 q.h.)

Introduction to probation and parole as dispositions, systems or subsystems, processes, and offender statuses. Includes the history of probation and parole, their conditions and revocation procedures, offender eligibility requirements, supervision styles, due process issues, and prediction and measurements of effectiveness. The role of volunteers, and probation and parole officer responsibilities are also discussed. Introduces

students to presentence investigations, shock probation, probation subsidy, expansion of probation into pretrial and restitution programs, and to current debates on the governmental framework of probation and parole, parole boards, and parole hearings. *Prereq.* CJ 4301.

CJ 4403 Introduction to Security (3 q.h.)

The organization and administration of security and loss prevention programs in industry, business, and government. Emphasizes the protection of assets, personnel, and facilities, and the relations between security organizations and government agencies.

CJ 4406 Security Management and Supervision 1 (formerly Security Administration 1) (3 q.h.)

The historical basis of the security management function and the development of the field in general and its various specialties. Examines concepts of organizational security and risk-management methods. *Prereq.* CJ 4403.

CJ 4407 Security Management and Supervision 2 (formerly Security Administration 2) (3 q.h.)

Organization, administration, and management of the security function, including the systems approach to security operations. Focuses on planning, organizing, staffing, directing, budgeting, controlling, representing and innovating. The manager's responsibility is also explored. *Prereq.* CJ 4406.

CJ 4408 Legal Aspects of Security Management and Operations (3 q.h.)

Provides a comprehensive examination of the legal environment and issues impacting security operations and management. Elements of criminal, civil, property, regulatory, and business law are analyzed from the perspective of organizational security management concerns. *Prereq.* CJ 4403.

CJ 4411 Electronic Information Security (3 q.h.)

Survey of the complex and developing security problems inherent in the use of electronic information systems. Provides a comprehensive examination of the management methods and technology used to counter the security risks related to the use of computers, word processors, and other communication devices and methods. *Prereq.* CJ 4403.

CJ 4412 Computer Crime and Security (3 q.h.)

This course is designed to introduce crimes involving the use of computers, the federal and state laws addressing them and the preventative and investigative methods used to secure computers, defend and prosecute offenders. Review and discussion of actual case studies and investigative experiences will be covered with an overall focus on security and investigative problems associated with computer crime. *Prereq.* COM 4101.

CJ 4413 Industrial Security (3 q.h.)

This course consists of an examination of the ways in which prevention-oriented security programs can be integrated into all phases of the research and manufacturing processes, involve line managers and supervisors, and gain executive support by introducing cost effective, operationally sound methods to protect all assets.

CJ 4415 Consumer Industry Security (formerly Service Industry Security) (3 q.h.)

Consumer-oriented activities, including such diverse businesses as the retailing and hospitality industries, are faced with the prospect of losses which can be caused by employees on one hand and the very consumers to whom they provide services on the other. This course studies the ways in which a completely integrated security function, emphasizing prevention, can contribute to an employer's profit margins.

CJ 4417 Institutional Security (3 q.h.)

Institutions, whether academic such as colleges and universities, or medical centers, not only have much in common, but also they are unique in their security requirements. This course examines the ways in which their needs can best be satisfied through the combined use of modern technology, security personnel, and the integration of the security function into all facets of institutional management.

CJ 4420 Advanced Computer Applications in Criminal Justice (3 q.h.)

This course examines the role of computers as both a tool of law enforcement and as evidence of a crime. Building on basic computer literacy skills students will develop the necessary skills to safely and effectively ana-

lyze seized or down-loaded magnetic media, illustrate complicated criminal enterprises and the related financial transactions. Students will utilize IBM compatible personal computers with database, spreadsheet, flow charting and presentation graphic programs to analyze and present a case study. *Prereq.* COM 4101.

CJ 4503 Forensic Laboratory (3 q.h.)

A hands-on laboratory course focusing on individual experimentation. Surveys the basic examinations and techniques performed in a crime laboratory. Topics include general microscopy, hairs and fibers, blood and other body fluids, paint, glass, soil, fingerprints, gunshot residue, toxicology, questioned documents, and firearm and toolmark examinations. (*Laboratory fee.*) *Prereq.* CJ 4203 and CJ 4204.

CJ 4504 Juvenile Justice 1 (3 q.h.)

Examination of the contemporary juvenile justice system, with focus on the key decision points within the juvenile justice system including jurisdiction, police, detention, court intake, adjudication, disposition, and aftercare. Critical issues facing the juvenile justice system components are discussed.

CJ 4505 Juvenile Justice 2 (3 q.h.)

Continuation of material discussed in CJ 4504. In particular, consideration is given to the history of juvenile justice in the U.S.; the major reforms of the juvenile justice system (diversion, the development of due process, decriminalization of status offenders, deinstitutionalization, and waiver to adult court); and future trends in juvenile justice. *Prereq.* CJ 4504.

CJ 4506 Crime Victims (3 q.h.)

Examination of current theories and research relating to victims of crime. Particular attention to special victim groups such as children, the elderly, and women. Victim interactions with the criminal justice system are explored. Current victim initiatives such as restitution, mediation, compensation, and victim rights legislation are also assessed. *Prereq.* CJ 4101 and CJ 4103.

CJ 4507 Organized Crime (3 q.h.)

The nature and problems of organized crime, its causes and effects, comparative and historic roots, and activities, organization, and economics. Considers possible solutions and the scope of techniques used in combatting organized crime.

CJ 4509 White-Collar Crime (3 q.h.)

Basic survey of white-collar crime: the nature and extent of white-collar crime, the social-psychological makeup of white-collar crime typologies, present efforts directed toward its control, and interagency and jurisdictional problems and the benefits of cooperation.

CJ 4510 Terrorism (3 q.h.)

An overview of terrorism and why it has become so popular. Topics include the role of news media, political consequences of terrorism, the military as a resource, and the role of the hostage.

CJ 4511 Survey of Criminal Evidence (3 q.h.)

The fundamentals of criminal trial procedure and the rules of evidence as they apply to the trial of a criminal case. Students read and brief criminal court cases. *Prereq.* CJ 4108 and CJ 4109.

CJ 4512 Women and the Criminal Justice System (3 q.h.)

Introduction to issues relating to roles taken by women involved with the criminal justice system and to the system's various responses to women in these roles. Specific focus on women as victims of crime, as offenders, and as criminal justice professionals.

CJ 4701 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24.

CJ 4702 Independent Study 2 (3 q.h.)

See CJ 4701.

CJ 4703 Independent Study 3 (3 q.h.)

See CJ 4701.

CJ 4805 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details.

CJ 4806 Advanced Tutorial 2 (3 q.h.)

See CJ 4805.

CJ 4811 Advanced Tutorial Intensive (6 q.h.)

Opportunity to take upper-level course sequence independently. See page 24 for details.

COMMUNICATION STUDIES

(formerly Speech Communication)

CMN 4101 Fundamentals of Human Communication (formerly SPC 4101 Effective Communication 1) (3 q.h.)

Introduction to the development of personal communication skills with an emphasis on elements in the communication process. Includes discussion of language use, nonverbal, listening and feedback and the role each plays in communication transactions.

CMN 4102 Group Discussion (formerly SPC 4102 Effective Communication 2) (3 q.h.)

Provides strategies for effective meeting management by focusing on group dynamics and the functions and tasks required of participants. Develops skills for successful group interactions and various group discussion techniques.

CMN 4104 Effective Communication (Intensive) (formerly SPC 4104) (6 q.h.)

Same as CMN 4101 and CMN 4102.

CMN 4105 Speaking Skills for Non-native Speakers (3 q.h.)

A course for persons who have previously studied English but who need to develop oral communication proficiency. Following diagnostic testing, students participate in individualized and group instructional situations.

CMN 4111 Voice and Articulation (formerly SPC 4111) (3 q.h.)

Development of the speaking voice, with emphasis on articulation, pitch control, and vocal variety and flexibility. Includes basic theory of the vocal mechanism.

CMN 4112 Advanced Voice and Articulation (formerly SPC 4112) (3 q.h.)

Continuation of CMN 4111. *Prereq.* CMN 4111 or instructor's permission.

CMN 4150 Self-Concept and Communication (formerly SPC 4150) (3 q.h.)

Through lectures, discussions, case studies, and classroom activities, students have an opportunity to become more aware of how our attitudes and habits affect our communication with others personally and professionally. Students will explore alternative communication patterns as they apply to these settings.

CMN 4151 Listening (formerly SPC 4151) (3 q.h.)

Analyzes listening effectiveness in professional and personal situations. Reasons for poor listening, techniques for effective listening, and giving and receiving feedback are covered.

CMN 4152 Conducting Interviews in the Professions (formerly Interviewing) (3 q.h.)

Helps students apply the current theory and research of interviewing to professional contexts. Topics include selection interviews, performance appraisal interviews, information gathering, problem-solving interview and persuasive interviewing.

CMN 4153 Techniques of Persuasion (formerly SPC 4153) (3 q.h.)

Covers communication strategies used when attempting to influence others. Examines instances of persuasion as they occur in advertising, politics, social interaction, sales, and business.

CMN 4154 Negotiation Skills (formerly SPC 4154) (3 q.h.)

Designed to introduce students to the techniques of dispute resolution. Particular attention is paid to the processes of mediation, facilitation, and negotiation. Through readings, lectures and class activities, students will have the opportunity to explore methods of applying these skills to professional settings.

CMN 4201 Argumentation (formerly SPC 4201) (3 q.h.)

Develops students' critical thinking abilities by analyzing specific argument contexts. Provides students with opportunities to develop, present and refute arguments, enhancing skills essential to success in an increasingly complex society.

CMN 4221 Interpersonal Communication (formerly SPC 4221) (3 q.h.)

Provides students with an opportunity to develop skills and strategies necessary for developing and maintaining effective personal and professional relationships. Topics include perception, self-disclosure, emotions, attitudes and values, nonverbal communication, language, improving communication climate and methods of conflict resolution.

CMN 4225 Family Communication
(formerly SPC 4225) (3 q.h.)

Introduction to how communication affects the development and maintenance of family relationships. Topics include marital, parent/child, sibling, and extended family communication patterns; problem identification and problem-solving skills in family communication.

CMN 4231 Gender Communication
(formerly SPC 4231 Female/Male Communication 1) (3 q.h.)

Provides students with an understanding of how gender influences verbal and non-verbal communication. Emphasis on enhancing communication competency at work and in relationships.

CMN 4235 Intercultural Communication
(3 q.h.)

Develops intercultural awareness. Topics include cultural differences in communication styles and assumptions, differing views of conflict and negotiation, and crosscultural communication including valuing and managing diversity in various settings.

CMN 4240 Managing Interpersonal Conflict (formerly SPC 4240) (3 q.h.)

Basic concepts involved in the management of conflict in interpersonal situations, such as understanding attitudes about conflict, studying message patterns in conflict interactions, and exploring a variety of conflict resolution methods.

CMN 4251 Business and Professional Speaking (formerly SPC 4251) (3 q.h.)

Covers practice in the organization and presentation of material to fit varying audiences. Emphasizes delivery techniques and effective presentation of ideas.

CMN 4252 Special Topics in Communication (3 q.h.)

Examination of a variety of subjects and themes in communication studies. Since topics change from quarter to quarter, students may take this course more than once, provided they focus on a different topic each time.

COMPUTER LITERACY

COM 4101 Foundations of Computer Literacy (4 q.h.)

Introduction to computers, including: operating systems (e.g., DOS, Windows) word processing, spreadsheets, database management systems, systems analysis and design, software packages, trends in office automation, and other issues regarding computers in today's society. Hands-on laboratory experience reinforces lectures.

SPECIAL EDUCATION

(formerly Counseling/Psych., Rehab./Spec. Ed.)

CRS 4200 Introduction to Special Education (3 q.h.)

Surveys the characteristics and the social, emotional, and educational adjustment of children and youth with special needs. Examines the effects of the disability, and of the individual's and society's attitudes toward the disability. Reviews current legislation.

CRS 4202 Introduction to Etiology and Development of Special Needs (3 q.h.)

Presents an overview of the etiology and development of handicapping conditions, current issues in these areas, problems associated with drug and substance abuse and other high risk factors, and curriculum strategies for dealing with early childhood, elementary, and middle school children with special needs conditions. *Prereq.* CRS 4200.

CRS 4204 Introduction to Assessment, Program Planning, and Implementation in Special Education (3 q.h.)

Presents the process of assessment, program planning, and implementation for individuals with special needs. Requires students to administer three education assessments, summarize the results in a case report, propose a program of education intervention, and identify methods to facilitate and monitor its implementation. *Prereq.* CRS 4202.

CRS 4206 Practicum (3 q.h.)

Allows for full-time participation in a University-arranged and supervised school program, emphasizing inclusive settings. Gives the student the opportunity to analyze the

teaching of and the learning by students with special needs and to demonstrate, evaluate, and develop teaching skills. *Prereq.* CRS 4204 and 2.5 QPA overall and in major.

ECONOMICS

ECN 4001 Overcoming Statistics Stress (noncredit)

This seminar is designed to show students how to put aside anxieties by understanding the components of statistics and developing techniques to simplify seemingly difficult word problems. Mathematical skills needed include addition, subtraction, division, multiplication, knowledge of square roots, and basic algebra.

ECN 4115 Economic Principles and Problems 1 (3 q.h.)

Application of the basic principles of economics to current public problems. Focusing on macroeconomics, students explore unemployment, inflation, national income and employment theory, and government expenditures and taxation.

ECN 4116 Economic Principles and Problems 2 (3 q.h.)

Continuation of ECN 4115, focusing on the role of the banking system, the Federal Reserve System, and supply-side policies. Topics in microeconomics include the role of a market pricing system, supply and demand, the costs of production, profits, and the supply decision. *Prereq.* ECN 4115 or *equiv.*

ECN 4117 Economic Principles and Problems 3 (3 q.h.)

Continuation of ECN 4116, focusing on markets and the allocation of resources. Topics include competitive markets, monopoly, oligopoly, factor markets, and income distribution. Economic principles are applied to selected problem areas, including poverty, pollution, energy, international trade, and the balance of payments. *Prereq.* ECN 4116 or *equiv.*

ECN 4118 Economics (Intensive) (9 q.h.) Same as ECN 4115, ECN 4116, and ECN 4117.

ECN 4130 Medical Economics (3 q.h.) Topics include health care trends in the United States; causes for increases in medical

care costs; supply and training of health care personnel; the nation's need for physicians, nurses, pharmacists, and other allied health personnel; the quality of medical care; economics of health insurance plans; and consumer demand for health care, medical facilities, and professional and semiprofessional personnel.

ECN 4137 History of Economic Thought (3 q.h.)

Development of economic thought, including Mercantilism as the first economic doctrine; analysis of the older, classical school with its later refinements (Modern Marginalism) and its important critics (socialists, Marxists); and Keynesian and modern developments.

ECN 4140 Economics of Crime (3 q.h.) Theoretical and empirical analyses of the economic causes of criminal behavior. The social costs of crime, its prevention, and techniques for designing optimum law enforcement policies.

ECN 4150 Energy Economics (3 q.h.) Economic, political, and historical background of energy and other resource problems, including examination of the future impact of primary resource limitations on U.S. and world economics and feasibility studies of resource substitution.

ECN 4215 Macroeconomic Theory 1 (3 q.h.) A discussion of conceptual and empirical problems of creating and using national accounts, price index problems, conceptual and empirical evaluation of consumption and investment functions and their policy implications, multiplier and accelerator models, and recent cyclical fluctuations. Analyzes theories of inflation, unemployment, and growth in light of recent economic history. *Prereq.* ECN 4117 or *equiv.*

ECN 4216 Microeconomic Theory 1 (3 q.h.) Examines supply and demand analysis, various elasticity concepts and applications, theories of demand and production, and derivation of cost curves. Analyzes pricing and output behavior in several market structures. Analyzes the pricing of resources, general equilibrium and economic efficiency, and a variety of topics in microeconomics such as externalities and public goods. *Prereq.* ECN 4117 or *equiv.*

ECN 4217 Macroeconomic Theory 2 (3 q.h.)
A continuation of ECN 4215.

ECN 4218 Microeconomic Theory 2 (3 q.h.)
A continuation of ECN 4216.

ECN 4219 Macroeconomic Theory Intensive (6 q.h.)
Same as ECN 4215 and ECN 4217. *Prereq.* ECN 4117 or *equiv.*

ECN 4220 Microeconomic Theory Intensive (6 q.h.)
Same as ECN 4216 and ECN 4218. *Prereq.* ECN 4117 or *equiv.*

ECN 4221 Selected Topics in Economics (3 q.h.)
Studies in a variety of macro- and micro-economic issues. Because topics change from quarter to quarter, students may take this course more than once, provided they focus on a different topic each time.

ECN 4250 Statistics 1 (3 q.h.)
Introduction to the collection and organization of data, including the measurement, presentation, and uses of elementary set theory; measures of central tendency and variability; basic probability; and probability distributions.

ECN 4251 Statistics 2 (3 q.h.)
Sampling and basic estimation techniques, "t" distribution, testing of statistical hypotheses, and analysis of variances. *Prereq.* ECN 4250 or *equiv.*

ECN 4252 Statistics 3 (3 q.h.)
Methods of econometric estimation and forecasting, including linear regression analysis, correlation analysis, time series analysis, and index numbers. *Prereq.* ECN 4251 or *equiv.*

ECN 4253 Statistics Intensive A (formerly Statistics Intensive) (9 q.h.)
Same as ECN 4250, ECN 4251, and ECN 4252.

ECN 4254 Statistics Intensive B (6 q.h.)
Same as ECN 4250 and ECN 4251.

ECN 4310 Labor Economics (3 q.h.)
Economic analysis of the labor market, including the labor force, the demand for labor, and the institutions and policies dealing with them. Examines employment, unemployment, wage determination, and the development and efficient use of labor resources

as well as collective bargaining issues and their economic consequences. *Prereq.* ECN 4117 or *equiv.*

ECN 4311 Human Resource Planning (3 q.h.)
Assessment of government and private efforts to fight poverty and improve the labor market position of impoverished groups. Considers the relationship between causes of poverty and discrimination and possible remedies. Also considers training programs, negative income tax, family allowances, and other income maintenance schemes.

ECN 4312 Economic Concerns of Older Adults (3 q.h.)
Designed to provide a basic knowledge of economic principles as they apply to senior members of the community. Includes how the U.S. economic policies and market system determine the price, quality, and availability of medical care and other allied services.

ECN 4313 Women in the Labor Force (3 q.h.)
Economic analysis of women's labor market position in the context of the changing economic structure and labor market institutions. Analysis of female labor force participation differences; male-female differentials in earnings and unemployment; occupational concentration, occupational segregation; theories and evidence of sex discrimination; and new opportunities for women.

ECN 4315 Income Inequality and Discrimination (3 q.h.)
Analysis of the composition of impoverished groups and recent trends. Examines the labor market, demographic and institutional forces contributing to poverty, the role of education, the economics of race and sex discrimination, the public welfare system, and proposed reforms.

ECN 4321 Urban Economic Problems and Policies (3 q.h.)
Economic analysis of selected urban problems such as housing, poverty, transportation, education, health, crime, and the urban environment. Includes discussion of public policies relating to such problems. *Prereq.* ECN 4117.

ECN 4322 Economics of Transportation (3 q.h.)

Transportation and land-use patterns, ownership, regulations, financing, social costs and benefits of various modes of transportation, and economies of new technology.

ECN 4323 Environmental Economics (formerly Economics of the Quality of Urban Environment and Control) (3 q.h.)

Economic analysis of air, water, thermal, and noise pollution. The utilization of urban space and other urban resources; identification of possible economic effects of urban environment, such as crime, delinquency, immobility, and congestion.

ECN 4330 Economic Growth and Development (3 q.h.)

Prospects for economic growth and development in impoverished nations as indicated by economic analysis and historical experience. Includes the social, cultural, and institutional determinants of growth and an analysis of agriculture and development.

ECN 4331 American Economic History (3 q.h.)

Economic development of the United States, with emphasis on the post-Civil War period and the effect of certain European developments.

ECN 4333 European Economic Development (3 q.h.)

Historical survey of European economic development from overseas expansion to the dissolution of empires and the Common Market. Examines the environmental impact of industrialism and the implications of living in a technological society.

ECN 4334 Comparative Economic Systems (3 q.h.)

Competing types of theoretical economic systems; analysis of the organization and operation of currently existing types of communist, socialist, and capitalist economies; and comparison and evaluation of the economic behavior and performance of different economic systems.

ECN 4335 International Trade (formerly International Economics 1) (3 q.h.)

Economics of international trade including tariffs, use of resources, and balance-of-payment mechanisms. *Prereq.* ECN 4117 or *equiv.*

ECN 4336 International Monetary Economics (formerly International Economics 2) (3 q.h.)

International commercial policy, financial organizations, and recent problems. *Prereq.* ECN 4335 or *equiv.*

ECN 4337 International Economics (Intensive) (6 q.h.)

Same as ECN 4335 and ECN 4336. *Prereq.* ECN 4117 or *equiv.*

ECN 4341 Money and Banking Intensive (6 q.h.)

Same as ECN 4342 and 4343. *Prereq.* ECN 4117 or *equiv.*

ECN 4342 Money and Banking 1 (3 q.h.)

Introduction to money and credit, commercial banking structure, and money creation as well as the problems and policies of centralized banking in the United States. *Prereq.* ECN 4117 or *equiv.*

ECN 4343 Money and Banking 2 (3 q.h.)

Topics include theory of money, prices, and monetary policy; interest theory; debt management; and international monetary problems and analysis. *Prereq.* ECN 4342 or *equiv.*

ECN 4344 Government Finance (3 q.h.)

Topics include fiscal functions, institutions, and politics; growth of the public sector; expenditure planning in theory and practice; cost-benefit analysis; principles of taxation and tax incidence; major taxes at federal, state, and local levels; fiscal policy for high employment, price stability and growth; and current fiscal problems, such as tax reform, urban fiscal problems, fiscal federalism, and income maintenance programs. *Prereq.* ECN 4117 or *equiv.*

ECN 4345 Business Cycles and Inflation (formerly Business Cycles 1) (3 q.h.)

Considers the theories of business cycles and inflation and an empirical application of these theories to current business cycles, inflation, and stagflation problems. *Prereq.* ECN 4117 and ECN 4215.

ECN 4350 Introduction to Econometrics (3 q.h.)

Methods of econometric estimation and forecasting, including various statistical techniques. Students are given the opportunity to construct their own models and use computer facilities for estimation and forecasting. *Prereq.* ECN 4117 and ECN 4252.

ECN 4351 Problems in Economic Research (3 q.h.)

Research methods used by practicing economists. Topics include typical problems from areas of applied economics, such as choices of modeling framework, development of static and dynamic adaptive policy models, problems of data collection, review of estimation techniques, and interpretation of results. *Prereq.* ECN 4117 and ECN 4252.

ECN 4353 Introduction to Mathematical Economics (3 q.h.)

Introduction to mathematical analysis, with an in-depth study of theory of distribution. *Prereq.* ECN 4117 or *equiv.*

ECN 4360 Managerial Economics (3 q.h.)

Theory of demand, price, and output as applied to business firms and capital budgeting. *Prereq.* ECN 4117 or *equiv.*

ECN 4362 Industrial Organization and Public Policy (3 q.h.)

Theoretical framework for analysis and evaluation of the static and dynamic performance of real markets. Examines empirical studies that test the usefulness of applying theory to real markets and the existence of antitrust laws as a public policy designed to promote better market performance. *Prereq.* ECN 4117 or *equiv.*

ECN 4363 Government and Business 1 (3 q.h.)

The rationale for government involvement in markets, the role of government in national economic affairs, and the relationship between government and business, including the application of antitrust laws to business.

ECN 4364 Government and Business 2 (3 q.h.)

The government's role in economic activities. The relationships between the government and industry, labor, agriculture, public utilities, and consumers. The changing role of government from laissez-faire policy to direct intervention in the economy. Wage and price controls, environment and anti-pollution policies, consumer protection, conglomerate mergers, and regulation of industries.

ECN 4384 The Economics of the Stock Market (3 q.h.)

Topics include the organization of the stock exchange, the highly speculative nature of the stock exchanges, the functions of the exchanges, capital gains, equity, dividends, stock options, splits, puts and calls, the crash of 1929, the crash of 1987, the Great Depression, controls on the stock market, and the Federal Reserve Board.

ECN 4492 Economic Policy Seminar (3 q.h.)

Most advanced course for senior economic majors, with emphasis on independent study and contemporary issues. *Prereq.* ECN 4215 and ECN 4216.

ECN 4495 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

ECN 4496 Honors Program 2 (4 q.h.)

See ECN 4495.

ECN 4497 Honors Program 3 (4 q.h.)

See ECN 4495.

ECN 4500 Advanced Tutorial 1 (3 q.h.)

Opportunity to take an upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

ECN 4501 Advanced Tutorial 2 (3 q.h.)

See ECN 4500.

ECN 4510 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

ECN 4511 Independent Study 2 (3 q.h.)

See ECN 4510.

ECN 4512 Independent Study 3 (3 q.h.)

See ECN 4510.

ECN 4601 Economics 1 (4 q.h.)

Development of macroeconomic analysis, review of national income concepts, national income determination fluctuation and growth, the role of the banking system and the Federal Reserve system, government expenditures and taxation, international trade, and balance of international payments. *For Alternative Freshman-Year students only.*

EDUCATION*

ED 4001 Integrated Language Skills Development 1 (2 q.h.)

Strives to improve a student's reading comprehension and related study and language skills. Devotes time, discussion, and considerable practice to meaningful skills such as basic reading comprehension and interpretation, including work in critical reading and other interpretational acts (inferences, understanding imagery, and symbolic usage). Focuses on study skills, reviewing, finding main ideas and details, outlining and summarizing, continuous interaction, and interaction of all the communications skills—reading, writing, listening, and speaking. *For Alternative Freshman-Year students only.*

ED 4002 Integrated Language Skills Development 2 (2 q.h.)

Continues discussion of topics introduced in ED 4001. *For Alternative Freshman-Year students only. Prereq. ED 4001.*

ED 4003 Integrated Language Skills A (4 q.h.)

Strives to improve a student's reading comprehension and related study and language skills. Devotes time, discussion, and considerable practice to meaningful skills such as basic reading comprehension and interpretation, including work in critical reading and other interpretational acts (inferences, understanding imagery, and symbolic usage). Focuses on study skills, reviewing, finding main ideas and details, outlining and summarizing, continuous interaction, and interaction of all the communications skills—reading, writing, listening, and speaking. *For Alternative Freshman-Year students only.*

ED 4004 Integrated Language Skills B (4 q.h.)

Extends ED 4003, with continued emphasis on study skills, including researching, organizing, and writing term papers. Explores critical thinking as it relates to the learning process. Also addresses the choices of academic major and career direction, emphasizing self-assessment and personal decision-making. *For Alternative Freshman-Year students only. Prereq. ED 4003.*

ED 4050 College Reading and Study Skills (3 q.h.)

Reading comprehension, text and lecture note-taking skills, and examination-taking

skills. Students practice with excerpts from texts and taped lectures, and apply the skills to materials in other courses. Intended for students who are beginning college work and wish to develop reading and study skills. *(Not for students who have already taken the Basic Day College courses Reading/Study Skills 1 or Integrated Language Skills Development 1.)*

ED 4101 Introduction to Education (3 q.h.)

Examines theories about the nature of teaching and learning. Evaluates the effects of traditional and innovative educational systems on learners. Considers the needs of the learner and the role of school and teacher.

ED 4102 Child Development and Learning (3 q.h.)

Surveys principles of child development from the pre-natal period through pre-adolescence. Examines learning and development in the context of relevant theory. Considers educational implications.

ED 4103 Adolescent Development and Learning (3 q.h.)

Examines social, emotional, and intellectual development in the adolescent years. Studies problems in the adolescent's family and social environments and in school adjustments.

ED 4406 Elementary Curriculum 1: Language Arts; Art; Music (3 q.h.)

This course examines the expressive components of a comprehensive and integrated language arts curriculum. Students will be involved in the process of learning how to integrate speaking, listening, visual arts, and music/movement experiences in developing curriculum for children at various stages of development. Students will analyze how the expressive aspects of curriculum relate to critical thinking, problem solving, and literacy improvement. *Prereq. ED 4101. Course is open only to students accepted into the Teacher Preparation Program.*

ED 4407 Elementary Curriculum 2: Social Studies (3 q.h.)

Describes and evaluates social studies curricula in use in the elementary school. Develops criteria to select appropriate social studies content, skills, and attitudinal objectives. Expects students to use these criteria to de-

*For Special Education, see CRS, page 183.

velop social studies experiences that meet the developmental needs of learners in a multicultural society. *Prereq. ED 4101. Course is open only to students accepted into the Teacher Preparation Program.*

ED 4408 Elementary Curriculum 3: Science and Mathematics (3 q.h.)

Surveys methods and materials for teaching elementary school science and mathematics. Students will examine curricula, related mathematics and science content, and strategies and materials for teaching in a manner that takes into account the developmental stages of children. *Prereq. ED 4101. Course is open only to students accepted into the Teacher Preparation Program.*

ED 4410 General Teaching Methods for High School (3 q.h.)

Considers methods and materials appropriate to teaching adolescents. Examines various models and strategies of instruction. Students will plan curricula and incorporate essential features of effective curriculum and teaching plans. The course seeks to encourage attitudes identified with tenets of good teaching. *Prereq. ED 4101. Course is open only to students accepted into the Teacher Preparation Program.*

ED 4411 Teaching in the High School: (a) mathematics; (b) science; (c) English; (d) history and social sciences (3 q.h.)

Examines the teaching of specific subject areas in the high school. Topics include organizing and presenting lessons, developing teaching materials, using instructional technology, and developing and implementing evaluation instruments. Students will examine the current curriculum resources in their subject areas. *Prereq. ED 4101. Course is open only to students accepted into the Teacher Preparation Program.*

ED 4412 Curriculum Development in the High School (3 q.h.)

Examines how goals and objectives are selected and how priorities are determined. Considers how educational programs are designed to meet goals, and how educational outcomes are evaluated. Compares different approaches to organizing learning experiences. *Prereq. ED 4101. Course is open only to students accepted into the Teacher Preparation Program.*

ED 4415 Reading/Learning Problems in Secondary School (3 q.h.)

Examines developmental and corrective reading/literacy programs at the secondary school level. Examines the development of reading rate, comprehension, and study skills in the content areas. Introduces formal and informal methods for assessing reading and writing ability. *Prereq. ED 4101. Course is open only to students accepted into the Teacher Preparation Program.*

ED 4426 Fundamentals of Reading (3 q.h.)

Considers reading as an aspect of language. Examines the major growth areas of reading and how reading acquisition is facilitated by developmental instruction. Considers major approaches to instruction in a whole language and experientially integrated environment. Also considers other aspects of literacy development. *Prereq. ED 4101. Course is open only to students accepted into the Teacher Preparation Program.*

ED 4817 Student Teaching Practicum (8 q.h.)

Allows for full-time participation in a University-arranged and supervised school program designed to analyze learning and teaching and to demonstrate, evaluate, and develop teaching skills. *Prereq. Formal acceptance into program and completion of advanced professional sequence and field experience with a QPA of at least a 2.000 in all professional courses and a minimum overall QPA of 2.500.*

EMERGENCY MEDICAL SERVICES

EMS 4107 EMT-Basic (9 q.h.)

The course covers evaluation and management of the following medical emergencies; cardiopulmonary arrest, severe bleeding and shock; fractured bones; care for heart attack, stroke, burn and poisoning victims; extrication and removal of victims from crashed vehicles and collapsed buildings; emergency childbirth and various other medical, emotional, and environmental emergencies.

EMT-Basic includes: 6 hours of class weekly for 12 weeks. Four (4) all day Saturday exercises (combination of indoor and outdoor) that include practical demonstration of ambulance and/or emergency vehicles and techniques. Ten (10) hours of in-hospital emergency room observation.

EMT Basic Skills: CPR (cardiopulmonary resuscitation), obstructed airway maneuvers, control of bleeding, taking vital signs (pulse/respiration/blood pressure), patient assessment, bandaging and splinting, emergency carries and lifting and moving devices (ambulance and orthopedic stretchers, etc.), triage at multi-victim accident.

EMS 4117 Emergency Medical Services 1
(4 cl., 6 lab., 6 q.h.)

Introduction to the Paramedic Program: role and responsibilities of Paramedics, medical terminology, human systems, patient assessment, blood, fluids and electrolytes, shock and shock management. The laboratory component provides the opportunity to correlate didactic knowledge while developing psychomotor skills. *To receive credit for this course, you must also register for BIO 4215/BIO 4217.*

EMS 4118 Emergency Medical Services 2
(4 cl., 6 lab., 6 q.h.)

Continuation of Paramedic Program: respiratory system, cardiovascular system, pathophysiology and emergency management, electrocardiograms, life-threatening dysrhythmias. The laboratory component provides the opportunity to correlate didactic knowledge while developing psychomotor skills. *Prereq. EMS 4117 or equiv.*

EMS 4119 Emergency Medical Services 3
(4 cl., 6 lab., 6 q.h.)

Continuation of Paramedic Program: central nervous system, soft tissue injuries, musculoskeletal system, medical emergencies, acute abdomen, genitourinary system, geriatric emergencies. The laboratory component provides the opportunity to correlate didactic knowledge while developing psychomotor skills. *To receive credit for this course, you must also register for BIO 4216/BIO 4218. Prereq. EMS 4118 or equiv.*

EMS 4120 Emergency Medical Services 4
(4 cl., 6 lab., 6 q.h.)

Continuation of Paramedic Program: obstetric/gynecologic emergencies, including emergency childbirth, neonatal and pediatric patients, emotionally disturbed patients, stress management, gaining access and extrication, multiple casualty incidents, emergency communications. The laboratory component provides the opportunity to correlate didactic knowledge while developing psychomotor skills. *Prereq. EMS 4119 or equiv.*

EMS 4121 Emergency Medical Services 5
(27.5 lab., 11 q.h.)

Clinical Practicum I of the Paramedic Program: application of theoretical knowledge and psychomotor skills in hospital unit rotations. ** Prereq. EMS 4120 or equiv.*

EMS 4122 Emergency Medical Services 6
(27.5 lab., 11 q.h.)

Clinical Practicum II of the Paramedic Program. ** Prereq. EMS 4121 or equiv.*

EMS 4123 Emergency Medical Services 7
(100 lab., 3 q.h.)

Field internship component of the Paramedic Program: opportunity to practice and develop all necessary psychomotor skills on an urban advanced life support system. ** Prereq. EMS 4122 or equiv.*

ENGLISH

ENG 4007 Advanced English for International Students (3 q.h.)

Advanced course in English as a second language. Practice in special forms of writing to improve clarity, syntax, and organization. *(May not be used to satisfy ENG elective requirements for English BA/BS degrees.) Prereq. Instructor's permission.*

ENG 4011 Elements of Writing (3 q.h.)

Review of the structural patterns of current English. Practice in writing sentences, paragraphs, and short papers. *(May not be used to satisfy ENG elective requirements for English BA/BS degrees.)*

ENG 4012 Elements of Grammar (3 q.h.)

A study of grammar and the way the English language works. Helps students improve their writing through an understanding of the parts of speech, the mechanics of punctuation, and the vagaries of spelling. Exercises in solving problems of number, case, tense, degree, and usage. *(May not be used to satisfy ENG elective requirements for English BA/BS degrees.)*

**Requires liability insurance coverage.*

ENG 4013 Fundamentals of English 1

(4 q.h.)

Intensive introduction to the principles of effective expository writing, emphasizing description, paragraph construction, and organization. Includes a review of the conventions of English usage, punctuation, and syntax. Essay assignments. *For Alternative Freshman-Year students only.*

ENG 4014 Fundamentals of English 2

(4 q.h.)

Intensive instruction in exposition, argument, and academic essay and research paper writing, in addition to continued study of the conventions of English usage, punctuation, and syntax. Essay assignments. *For Alternative Freshman-Year students only. Prereq. ENG 4013 or equiv.*

ENG 4100 Critical Writing 1 (formerly**ENG 4110 3 q.h.) (4 q.h.)**

Detailed examination of the principles and methods of rhetoric, especially narration, description, and exposition. Includes frequent practice in writing paragraphs and themes in those modes. *A writing proficiency test is given at the first class meeting.*

ENG 4111 Critical Writing 2 (3 q.h.)

Continued examination of the principles and methods of rhetoric, especially persuasion and argument, the study of short fiction, and the development of research skills. Includes practice in writing persuasive and critical themes and in preparing research papers. *Prereq. ENG 4100 or equiv.*

ENG 4112 Critical Writing 3 (formerly**Approaches to Literature) (3 q.h.)**

Further refinement of writing and analytical skills through the study of drama and poetry. Practice in writing longer critical papers. *Prereq. ENG 4111 or equiv.*

ENG 4114 Poetry (3 q.h.)

An introductory course in the techniques, forms, structures, and styles of both traditional and contemporary poetry in English. Indispensable to any upper-level courses that deal with poets as major figures, this basic course should leave students with the essential terms of poetic analysis and with an appreciation of the challenges that poets set both for themselves and their readers.

ENG 4116 Drama (3 q.h.)

Examines the techniques, forms, structures, and styles of traditional and contemporary

plays, by a close reading of selected texts, the study of critical terms, and practice in a variety of critical approaches; and provides valuable preparation for upper-level courses in drama.

ENG 4117 Fiction (3 q.h.)

Explores the techniques, forms, structures, and styles of short stories and novels, by a close reading of selected texts, the study of critical terms, and practice in a variety of critical approaches; and provides valuable preparation for upper-level courses in fiction.

ENG 4120 English Literature: Faith and Humanism (3 q.h.)

English literature from its beginnings to 1700, including works by Chaucer, Spenser, Shakespeare, Donne, and Milton.

ENG 4121 English Literature: Reason and Romanticism (3 q.h.)

English literature from the Neoclassical period to the Romantic age, including works by Pope, Swift, Johnson, Blake, Wordsworth, and Keats.

ENG 4122 English Literature: Victorians and Moderns (3 q.h.)

English literature from the Victorian Age through the twentieth century, including works by Browning, Arnold, Hardy, Yeats, and Eliot.

ENG 4123 Early American Literature: Faith, Reason, and Nature (3 q.h.)

American literature from its beginnings through the nineteenth-century Transcendentalists, including works by Bradstreet, Taylor, Edwards, Franklin, Emerson, and Thoreau.

ENG 4124 American Romantics and American Realists (3 q.h.)

The fiction and poetry of nineteenth-century America, including works by Hawthorne, Melville, Whitman, Dickinson, Twain, James, Crane, and Dreiser.

ENG 4125 American Literature: The Modern Temper (3 q.h.)

The prose and poetry of twentieth-century America, including works by Eliot, Stevens, Fitzgerald, Hemingway, Wright, and Plath.

ENG 4131 God, Gods, and Heroes: The Literature of the Ancient and Medieval Worlds (3 q.h.)

Literary traditions of the ancient world and the Middle Ages in the works of such writers as Homer, Aeschylus, Sophocles, Euripides, Aristophanes, Virgil, and Dante, as well as in the art of biblical narrative.

ENG 4132 Man, Reason, and Imagination: Literature from the Renaissance to the Romantic Age (3 q.h.)

Literary traditions of the Renaissance, Neoclassicism, and Romanticism in the work of such writers as Machiavelli, Moliere, Racine, Voltaire, and Goethe.

ENG 4133 Order and Disorder: Literature of the Moderns (3 q.h.)

Literary traditions of Realism and Modernism in the work of such writers as Dostoevsky, Ibsen, Mann, Kafka, and Sartre.

ENG 4213 Detective Fiction (3 q.h.)

Elements of intrigue, logic, and thought converge in this study of the whodunit. Students sample a wide range of detective fiction to explore the questions of innocence and guilt, action and responsibility, power and authority, and victim and victimizer, and to see connections between this popular form of literature and its classical antecedents.

ENG 4221 Images of Women In Literature (3 q.h.)

Images of women and their underlying archetypes in imaginative literature. Includes such writers as Homer, Austen, Ibsen, and Lawrence.

ENG 4222 American Women Writers (3 q.h.)

Representative nineteenth- and twentieth-century American women writers, including such poets as Dickinson and Plath and such novelists as Chopin and Cather.

ENG 4223 British Women Writers (3 q.h.)

Important historical and thematic connections in the work of British women writers of the last two hundred years, including the novels of Austen, Eliot, Woolf, and Lessing.

ENG 4236 Literary Journalism (3 q.h.)

Explores literary journalism as an emerging class of writing that challenges established concepts of fiction and nonfiction. Students will consider questions of accuracy and cred-

ibility, literal and figurative representation, structure and narrative voice. Texts may include *Fatal Vision*, *Hiroshima*, *In Cold Blood*, and *Invasive Procedures*.

ENG 4240 Fiction and the Movies (3 q.h.)

Reading and seeing: an examination of the success (and failure) of turning famous novels and stories into movies. Analysis of book-film case studies such as *The Postman Always Rings Twice*, *Howard's End*, *Sophie's Choice*, *The Unbearable Lightness of Being*, *The Silence of the Lambs*, and *The Last Picture Show*. Includes elementary film theory and criticism.

ENG 4241 Topics In Film (3 q.h.)

Explores a chosen theme in literature and in film, drawing upon important cultural, political, or psychological issues of our time. Focuses on a different topic each quarter, using films inspired by both classic and contemporary novels, stories, and plays—for example, *Literary Heroines Go Hollywood*, *Paranoia: From Hitchcock to Oliver Stone*, *Films from Shakespeare*—so that students may take this course more than once.

ENG 4242 Screenwriting (3 q.h.)

An introduction to the craft of constructing a feature-length shooting script for film or television. Emphasis is on the close defining of plot ideas and the "sound" of the characters, on the structuring of effective short scenes and longer sequences, and on learning some of the cinematic techniques and trade secrets peculiar to the art of film writing. Video clips will be analyzed throughout the course.

ENG 4243 Screenwriting Workshop (3 q.h.)

An advanced course, intended primarily for students wishing to complete or polish scripts begun in ENG 4242. May also be taken by anyone who already knows the fundamentals of the screenwriting format and now wishes to begin a new project or finish one started elsewhere. *Prereq.* ENG 4242 or instructor's permission.

ENG 4349 Expository and Persuasive Writing 1 (3 q.h.)

Designed to help students develop confidence and proficiency in writing. Through first drafts to revisions, weekly writing assignments concentrate on mastering the skills of subject focus, clarity of expression, controlled development, and organization. *Prereq.* ENG 4100 or equiv.

ENG 4350 Expository and Persuasive Writing 2 (3 q.h.)

Development of precise and persuasive writing patterns through experiments with various rhetorical strategies. Students are expected to write extensively on topics of current interest to gain fluency and to learn how to target their writing toward different audiences. Assignments also provide practice in persuasive writing and in using different writing models to gain control of the material. *Prereq.* ENG 4349 or *equiv.*

ENG 4352 Expository Communications (3 q.h.)

Workshop in expository prose, emphasizing the practical problems of the writer on the job in advertising, public relations, or publishing. Includes practice in designing and writing special projects. *Prereq.* ENG 4350 or *equiv.*

ENG 4353 Expository and Persuasive Writing Intensive (6 q.h.)

Same as ENG 4349 and ENG 4350. *Prereq.* ENG 4100 or *equiv.*

ENG 4356 Creative Writing (3 q.h.)

An opportunity to write and develop a variety of forms, including experiments in journals and short stories, plays and poems. Features in-class discussion of students' work and a final project of choice.

ENG 4357 Creative Writing: Poetry (3 q.h.)

Practice in writing different forms of poetry for beginning poets. Includes discussion and criticism of student work and selected texts.

ENG 4358 Creative Writing: Fiction (3 q.h.)

Practice in writing various types of short stories for beginning writers of short fiction. Includes discussion and criticism of student work and selected texts.

ENG 4359 Creative Writing Workshop (3 q.h.)

Discussion and criticism of student manuscripts for practicing writers.

ENG 4361 Creative Writing 4 (3 q.h.)

A master class designed for those students who have taken the basic creative writing courses (ENG 4356, ENG 4357 or ENG 4358, and ENG 4359). Students are expected to be committed writers and comfortable with critical appraisals and exchanges. Open to both fiction writers and poets (with the instructor's permission).

ENG 4363 Writing for the Marketplace (3 q.h.)

Workshop for writers venturing into the marketplace. Provides a working knowledge of the publishing industry and useful practice in preparing and editing manuscripts for publication. Includes the development of effective strategies for composing query letters, synopses, outlines, and sample manuscripts.

ENG 4364 Creative Writing: Autobiography (3 q.h.)

Concentrates on the literary communication of emotional truths harbored in factual material. Uses memories, dreams, journals, and a variety of exercises as approaches to writing. Readings include published memoirs and essays about memoir writing. *Prereq.* ENG 4100 *strongly advised.*

ENG 4372 Manuscript Editing (formerly ART 4604) (3 q.h.)

For novices who wish to break into the field or those who edit on the job. Numerous written exercises give students practice in handling common problems in editing book and magazine manuscripts. Includes practice in spelling, grammar, syntax, and style.

ENG 4380 Writing for the Professions 1 (formerly Business Writing and Reports 1) (3 q.h.)

Introduction to the vocabulary and philosophy of business communications. Practice in planning, writing, and analyzing effective business letters and memoranda. *A writing proficiency test is given at the first class meeting.*

ENG 4381 Writing for the Professions 2 (formerly Business Writing and Reports 2) (3 q.h.)

Methods and principles of research and documentation of semitechnical analyses and business reports. Practice in organizing and writing complex forms of business communications. *Prereq.* ENG 4380 or *equiv.*

ENG 4383 Writing for the Professions Intensive (formerly Business Writing and Reports Intensive) (6 q.h.)

Same as ENG 4380 and ENG 4381. *A writing proficiency test is given at the first class meeting.*

ENG 4384 Workshop in Case Study Analysis (formerly Advanced Writing for the Professions) (3 q.h.)

Designed for business students seeking writing skills for graduate school or undergraduate courses that require written analysis of case studies. In addition to writing strategies, critical thinking and problem solving will be taught. *Prereq.* ENG 4381 or 4383 or instructor's permission.

ENG 4440 Literary Theory and Criticism (formerly ENG 4115) (3 q.h.)

An introduction to traditional and modern literary theory and criticism, and may include such historical figures as Plato and Aristotle, Sidney and Wordsworth, and such contemporary approaches as Marxist, feminist, psychoanalytic, and post-structuralist.

ENG 4500 The English Language (3 q.h.)

Development of modern English from its pre-Anglo-Saxon beginnings. Effects of Roman, Scandinavian, and Norman invasions; dialect geography; evolutionary change; and word formation and borrowing.

ENG 4501 Linguistics (3 q.h.)

Studies the nature of language as a function of sentence structure (syntax), meaning (semantics), word forms (morphology), and speech sounds (phonology), as well as issues related to it, such as the Black English/Standard English debate, the nature/nurture controversy, and the linguistics of gender argument.

ENG 4600 Topics in Literature (3 q.h.)

Examines a variety of subjects and themes, such as the Bible as literature, ethnic literature in America, the American Dream, modern Irish writers, Latin American fiction, Russian masterworks, science fiction, fantasy literature, horror fiction, the literature of old age, the new essayists, and the relationship between literature and the arts. Because topics change from quarter to quarter, students may take this course more than once, provided it is a different topic each time.

ENG 4604 Major Figure in Literature (3 q.h.)

Examines in detail and depth the work of a major writer of poetry, fiction, or drama, such as Whitman, Tolstoy, Woolf, or Beckett. Students may take this course more than once, provided they focus on a different figure each time.

ENG 4609 American Poetry (3 q.h.)

Surveys American poetry from the beginnings to the present. Includes such poets as Poe, Whitman, Dickinson, Frost, Stevens, Cummings, Hughes, Brooks, Ginsberg, and Rich.

ENG 4610 The American Short Story (3 q.h.)

Development of the American short story from its nineteenth-century origins to its present forms. Includes such writers as Poe, Hawthorne, James, Hemingway, Roth, and Updike.

ENG 4611 The American Novel (3 q.h.)

Development of the novel in America and its characteristic qualities. Includes such writers as Cooper, Melville, James, Wharton, Faulkner, and Ellison.

ENG 4640 Twentieth Century English Literature (formerly The Twentieth Century) (3 q.h.)

An examination of some of the major writers in England and the movements, such as Realism or Post Modernism, that marked their fiction and poetry. Authors studied may include William Butler Yeats, James Joyce, Virginia Woolf, Dylan Thomas, Muriel Spark, Anthony Burgess, and Iris Murdoch.

ENG 4641 Twentieth Century American Literature (3 q.h.)

An examination of some of the major American writers of the twentieth century and the movements and themes that marked their fiction and poetry. Authors to be studied may include Ezra Pound, T.S. Eliot, Robert Frost, William Carlos Williams, F. Scott Fitzgerald, Ernest Hemingway, Flannery O'Connor, Allen Ginsberg, and Alice Walker.

ENG 4642 The English Novel (3 q.h.)

Development of the English novel from its beginnings in the eighteenth century through its concern with manners and morals in the nineteenth century to the experimentation of the twentieth century. Includes such writers as Fielding, Richardson, Austen, Dickens, Eliot, and Woolf.

ENG 4643 English Drama (3 q.h.)

Surveys representative English drama, excluding Shakespeare, from the beginnings to the modern times, from *Everyman*, for example, to *Waiting for Godot*, tracing the changing role of theaters and audiences, dramatic conventions and acting styles.

ENG 4649 European and English Short Story (3 q.h.)

Development of the short story in Europe and England in both the nineteenth and twentieth centuries. Includes such writers as de Maupassant, Balzac, Mann, Camus, Kipling, Lawrence, Greene, and Böll.

ENG 4650 Modern Bestsellers (3 q.h.)

The fascinating world of modern bestsellers, a world of romance and adventure, of high living and sinister intrigue, by such popular writers as Rona Jaffe, Harold Robbins, Jacqueline Susann, and Irving Wallace.

ENG 4651 The Continental Novel (3 q.h.)

Development of the European novel through its various forms and themes, from Balzac and Tolstoy to Proust and Mann.

ENG 4655 Contemporary Fiction (3 q.h.)

An examination of some of the most influential fiction of the last quarter century. Authors will vary, and students may expect to study writing by both established and emerging writers. Authors such as Alice Walker, Russell Banks, Jay McInerney, Toni Morrison, and Milan Kundera will be studied.

ENG 4658 Introduction to Shakespeare

(formerly Shakespeare the Dramatist) (3 q.h.) Detailed examination of representative plays from Shakespeare's early, middle, and late periods in order to illustrate his development as a dramatist and define his principal themes in such plays as *A Midsummer Night's Dream*, *Romeo and Juliet*, and *King Lear*.

ENG 4659 Shakespeare: The Major Tragedies and Comedies (3 q.h.)

Study of examples of Shakespeare's mature dramatic art, such as *As You Like It*, *Much Ado About Nothing*, *Hamlet*, *Macbeth*, and *Antony and Cleopatra*.

ENG 4660 Shakespeare on Film (3 q.h.)

A survey of the variety of ways Shakespeare has been adapted to the screen, featuring classic versions of the great tragedies by Orson Welles, Laurence Olivier, and Roman Polanski, as well as Kenneth Branagh's *Henry V* and Burton and Taylor in *The Taming of the Shrew*.

ENG 4802 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

ENG 4803 Honors Program 2 (4 q.h.)

See ENG 4802.

ENG 4804 Honors Program 3 (4 q.h.)

See ENG 4802.

ENG 4815 Advanced Tutorial 1 (3 q.h.)

Opportunity to take an upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

ENG 4816 Advanced Tutorial 2 (3 q.h.)

See ENG 4815.

ENG 4820 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

ENG 4821 Independent Study 2 (3 q.h.)

See ENG 4820.

ENG 4822 Independent Study 3 (3 q.h.)

See ENG 4820.

ENG 4823 Field Work in Writing for the Professions (formerly Field Work in Business Writing) (6 q.h.)

Allows students to earn credit for the application of their academic background in business writing to practical problems in the workplace. *Prereq.* ENG 4380 and ENG 4381 and Program Office approval.

EARTH SCIENCES

ESC 4103 Introduction to the Earth Sciences: The Solid Earth (3 q.h.)

A general introduction to the processes that affect the earth's surface and interior: the effects of rivers and glaciers on the earth's surface; the influence of wind, waves, currents and storms on coasts; plate tectonics and the origin of volcanoes, mountain belts, and earthquakes.

ESC 4104 Introduction to the Earth Sciences: Earth's Oceans and Atmosphere (3 q.h.)

This course is a general introduction to the earth's oceans and atmosphere. The course explores how the sea is affected by: the rotation of the earth; by sunlight; by the gravity of the moon and sun; by glaciers and rivers; and by the surrounding continents. The earth's weather systems are influenced by many of the same factors, and the course uses this background to explain the broad patterns of winds and storms on our planet.

ESC 4105 Introduction to the Earth Sciences: Earth and the Planets (3 q.h.)

This course considers current ideas on the development of the solar system. It describes how the earth and moon evolved as planetary bodies, and contrasts their development with that of the other planets and moons in terms of size, distance from the sun, and bulk composition. Many observations are used to describe current thoughts about how the solar system has developed, including: telescope studies of the sun, moon and planets; studies of rock samples returned from the moon and of meteorites found on the earth; and data obtained by planetary lander and fly-by missions.

ESC 4107 Solid Earth, Oceans and Atmosphere (6 q.h.)

Same as ESC 4103 and ESC 4104.

ESC 4109 Introduction to the Earth Sciences (Intensive) (9 q.h.)

Same as ESC 4103, ESC 4104, and ESC 4105.

ESC 4111 Geology of the Boston Area (3 q.h.)

Designed to give students without prior field experience a working knowledge of the bedrock and glacial development of the Boston metropolitan area. There will be six regular class meetings of standard length and two all-day Saturday field trips.

ESC 4203 Gemology (3 q.h.)

Topics include aspects of crystallography and physical properties of minerals relevant to gemstones; gem cutting methods; origin of color in minerals; behavior of light in minerals and its influence on gem cutting; types of inclusions found in gemstones and their effects on optical properties (star sapphire, cat's eye); techniques of growing crystals; geology and geography of selected gem deposits; properties of the major types of gemstones and imitations.

ESC 4214 Biology of Coastal Environments (3 q.h.)

Provides hydrological, biological, and ecological descriptions of coastal zone habitats, which are important economic resources whose use is governed by extensive legislation. Explores the physical and biological components of major coastal zone habitats: bogs, dunes, salt marshes, mud flats, sea grass beds, intertidal, sub-tidal, estuarine,

continental shelf. Specific interactions between these habitats (nutrient/energy flow, fisheries nursery grounds) and processes which influence them (beach erosion, dredging, silting) are also considered. Key species and characteristics of each habitat, their importance as natural resources, the impact of environmental engineering, and mitigation techniques are also discussed. *Prereq. Knowledge of general biology and general chemistry.*

ESC 4218 Groundwater (3 q.h.)

The course discusses the geologic nature of different types of aquifers in New England and other parts of the world, and examines the principles of groundwater flow in permeable rock and soil. *Prereq. Calculus course or permission of the instructor.*

ESC 4219 Geochemistry of Groundwater (3 q.h.)

The course describes how the composition of uncontaminated groundwater is affected by the chemistry of precipitation and by reactions with the organic and inorganic components of soil and rock. The course next considers the geochemical aspects of a number of specific groundwater contamination problems including: leachate plumes from landfills; improper disposal of hazardous wastes; leaking underground storage tanks; saltwater intrusion of coastal aquifers; etc. *Students should have taken at least one chemistry course.*

ESC 4220 Wetlands (3 q.h.)

The course explores the hydrology and biogeochemistry of wetlands, describes the attributes of specific wetlands types, and examines current wetland protection and management strategies.

ESC 4221 Environmental Geophysics (3 q.h.)

Intended for both students and practicing professionals, this course will show how geophysical techniques can help solve a wide range of environmental and engineering problems. After a brief historical survey, the most commonly used methods are considered in detail, including: seismic, gravity, magnetics, resistivity, electromagnetics, ground penetrating radar, and borehole methods. Emphasis on practical applications, and numerous case studies will be used as examples. Students will have the opportunity to design and plan geophysical studies based on actual and theoretical situations.

ESC 4233 The Earth's Atmosphere (3 q.h.)

An introduction to the science of meteorology, in more detail than the treatment in ESC 4104. This course describes how the sun's heat, the earth's gravity, and the earth's rotation combine to cause the large-scale patterns of winds on our planet. After describing why winds generally move east-to-west in some latitudes and west-to-east in others, the formation and motion of smaller air masses and weather fronts is considered, a topic continued in greater depth in ESC 4234.

ESC 4235 Weather Forecasting and Climate Change (3 q.h.)

This course begins by discussing the kinds of data that meteorologists use to make short-term weather forecasts; how the data are obtained and summarized on weather maps; and how the maps and computers assist in forecasting the weather. The second part of the course steps backward in time to examine the causes of the earth's long-term climate fluctuations, on a scale of tens of thousands of years, using the Milankovic hypothesis (changes in the earth's orbit, etc.). Implications of the Milankovic model, plus possible warming due to the Greenhouse Effect, are used to discuss possible future changes in the earth's climate. (*ESC 4233 useful but not required.*)

ESC 4239 Observational Astronomy (3 q.h.)

Introduction to the planets, stars, and constellations visible to the naked eye through lectures and outside viewing sessions. Emphasizes stars and constellations easily seen from mid-northern latitudes.

ESC 4243 Stars (3 q.h.)

This course traces the events that occur throughout the lifetimes of different kinds of stars. Topics include: the sun as a model star; the differences that are observed in mass, temperature, and types of energy emitted among different types of stars; formation of stars; creation of chemical elements within stars and dispersal of these elements into surrounding space during super-novas; and processes that stars undergo in their juvenile stage, through middle age, to death. *Prereq. ESC 4239 recommended.*

ESC 4250 Conservation and the Nation (3 q.h.)

This course provides an overview of the ways in which people interact with the environment. Topics covered include: air and

water pollution; waste disposal; farming and soil conservation; and general principles of ecology, emphasizing human impact on the environment and how it has changed in North America over the past few hundred years.

ESC 4251 Conservation and the Community (3 q.h.)

Study of conservation problems and land-use practices at the local level. Includes an in-depth study of urban development and its impact on the environment. *Prereq. ESC 4250 recommended.*

ESC 4252 Conservation Management (3 q.h.)

This course reviews the structure of local governments and the role played by government in regulating people's impact on the environment. Topics include: land use planning and zoning; conservation commissions; wetlands protection; groundwater and drinking water protection; solid waste and hazardous waste management; and sources of information or assistance for community efforts. *Prereq. ESC 4251 is recommended.*

ESC 4430 Soils and the Environment (3 q.h.)

An introduction to the origin, characteristics, and classification of soils, emphasizing important types found in southern New England. The course provides an overview of important physical, chemical and biological processes which affect the development of soils, and discusses the role played by grain size, mineral type, and organic content of soils in controlling the migration of contaminants through the soil horizon.

ESC 4435 Air Quality (3 q.h.)

While modern societies contribute much pollution to the atmosphere, natural processes can also adversely affect air quality. This course discusses the wide range of impacts which can affect air quality including: particulates such as asbestos or lead-rich dust, volcanic ash, or ash from forest fires and power generation; biological inputs such as pollen and methane from landfills or cattle feedlots; and gaseous chemical pollutants such as radon and volatile organic compounds. It provides an overview of current air-quality legal standards, and methods of monitoring air quality.

ESC 4450 Introduction to Hydrology (3 q.h.)

This course describes the processes which affect the movement and composition of water at and near the earth's surface, including rain and atmospheric chemistry; ground-

water; rivers; lakes; estuaries; and the sea. Also discussed are the global cycles of nutrients (nitrogen, phosphorus); physical processes which control the seasonal vertical mixing of lakes; and an introduction to the use of box models to estimate the buildup or removal of pollutants in bodies of water.

ESC 4680 Science, Technology, and Ancient Societies (3 q.h.)

Interdisciplinary course conducted using an independent study/seminar approach. An examination of changes in sciences, technologies, and societal structures from pre-history through classical cultures and the beginning of the Renaissance.

ESC 4681 Science, Technology, and Modern Societies (3 q.h.)

Interdisciplinary course conducted using an independent study/seminar approach. An examination of changes in sciences, technologies, and societal structures from the beginning of the Renaissance through the period of industrialization and the present day.

ESC 4682 Science, Technology, and Society (Intensive) (6 q.h.)

Same as ESC 4680 and ESC 4681.

ESC 4700 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

ESC 4701 Advanced Tutorial 2 (3 q.h.)

See ESC 4700.

ESC 4801 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

FINANCE

FI 4101 Personal Finance (3 q.h.)

A practical approach to problems involved in managing personal finances. Includes financial planning, budgeting, obtaining credit and loans, income taxes, savings and investments, life insurance, home buying, and estate planning. Subjects are treated in a nontechnical manner. Recommended for non-finance majors.

FI 4104 Planning Your Investment Portfolio (3 q.h.)

Participants work with the instructor to de-

velop their own personal investment portfolio. The course begins with each student setting his/her investment goals in terms of desired profitability, risk taking and the timing of wealth creation. After an introduction to Wall Street, stocks, bonds, mutual funds and other investments are evaluated and selected to comprise portfolios that best meet each participant's goals. (For non-finance majors.)

FI 4301 Principles of Finance (3 q.h.)

The scope and nature of finance, introducing basic financial concepts and principles. Includes financial analysis, financial planning, working capital management, the time value of money, and an introduction to financial markets and different types of securities. Spreadsheets used. *Prereq.* ACC 4102, ECN 4116 and MIS 4102 or MIS 4114.

FI 4302 Financial Management (3 q.h.)

Introduction to financial management from both domestic and international perspectives. Includes valuation, leverage, financial analysis and planning, working capital management, capital budgeting, cost of capital, and long-term and short-term financing decisions. Spreadsheets used. *Prereq.* FI 4301. *Please bring a calculator to class.*

FI 4306 Personal Insurance Planning (formerly Personal Financial Planning) (3 q.h.)

Insurance planning is an important part of financial planning. Class focus is on the informed decisions necessary to establish a comprehensive, rational plan of personal insurance. Class discussion, lectures, and readings examine the various kinds of personal insurance and how to create an insurance package for different insurance needs.

FI 4307 Small Business Finance (3 q.h.)

Uses basic processes, principles, tools, and concepts of finance within the parameters of a small business to develop a complete financial plan that projects the future circular flow of funds by analyzing and then integrating the impact of both investment decisions (use of funds) and financial decisions (source of funds).

FI 4310 Investment Principles (3 q.h.)

Investment concepts, practices, and procedures. Reviews various types of investments, including the role of security markets and security analysis. *Prereq.* FI 4301.

FI 4320 Credit Principles (3 q.h.)

Introduction to credit and its functions. Examines the role of the credit executive, credit investigation, documentary credit, trade credit, and organization of the credit department. *Prereq.* FI 4301.

FI 4325 Budgeting and Planning (3 q.h.)

Studies the interrelation between functional areas in an organization using consolidated profit planning as an integrating device. Topics covered include: cost concepts, cost-volume-profit analysis, profit planning, general expense planning, production planning, purchasing, activity-based costing, and just-in-time inventory management. *Prereq.* FI 4301.

FI 4332 Management of Banks and Financial Institutions (3 q.h.)

Financial management and operation of bank and nonbank financial institutions and their role in the economy. Discusses objectives, services, asset management, liquidity, pricing, capital adequacy, and sources of financing and profitability in a changing economic and regulatory environment. Lectures, discussions, and case studies. *Prereq.* FI 4302. *Not open to students who have taken FI 4330 or FI 4335.*

FI 4336 Risk Management and Insurance (3 q.h.)

Emphasizes the functional area of corporate risk management. Covers such topics as organizing and controlling the risk management function; identifying, measuring, controlling, and financing risk; selecting the best method of risk treatment; and implementing and monitoring risk management. Topics of exposure analysis include property, liability (public, employer, products, officers and directors, and professionals), income, and extraordinary expense losses. Covers treatment methods such as self-insurance and commercial insurance. Includes recent developments such as tort reform, integration of risk management with managerial finance with special emphasis on pensions, profit sharing plans, and international considerations. *Prereq.* FI 4302.

FI 4360 Speculative Markets (3 q.h.)

Studies futures contracts and options contracts, their rapid growth in speculative markets, and the uses of these contracts. Both individual investors and institutional investors

such as portfolio managers, banks, multinational corporations, and mutual funds can now minimize their exposure to movements in stock prices, exchange rates, and interest rates by following active and dynamic portfolio strategies that employ these new instruments. *Prereq.* FI 4411 or instructor's permission.

FI 4403 Financial Strategy (Reserved) (3 q.h.)

Financial management using the case-method approach. Includes advanced capital budgeting, capital structure. Decision-making, dividend policy, leasing, convertibles and warrants, mergers, failures and reorganization, and the timing of financial policy. *Prereq.* FI 4302 and 80 q.h.

FI 4411 Investment Management (Reserved) (3 q.h.)

Relationship between the economy and stock prices. Covers corporate analysis, earnings, dividends, and cash flow and introduces portfolio analysis. Studies technical analysis versus fundamental factors. *Prereq.* FI 4310 and 80 q.h.

FI 4421 Credit Management (Reserved) (3 q.h.)

Forms of credit and collection services, including analysis of financial statements, determination of credit-worthiness, creditors' rights, adjustment bureau operations, credit insurance, and guarantees. *Prereq.* FI 4320 and 80 q.h.

FI 4426 Financial Control (Reserved) (3 q.h.)
Studies the development and application of flexible budgets, planning and control of capital expenditures, computer applications in financial analysis and profit planning, pricing decisions, control of decentralized operations, and analysis of budget variations. *Prereq.* FI 4325.

FI 4450 International Finance (Reserved) (3 q.h.)

Introduction to international financial management in the multinational corporation. Analyzes basic problems and finance considerations involved with international investments, trade, and payments. Also covers planning in the international environment related to exchange rates, financial strategy, sources of capital, working capital management, fund flows, and management control through accounting and financial reporting. *Prereq.* FI 4302 and 80 q.h.

FI 4600 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

FI 4601 Honors Program 2 (4 q.h.)

See FI 4600.

FI 4602 Honors Program 3 (4 q.h.)

See FI 4600.

FI 4701 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

FI 4702 Independent Study 2 (3 q.h.)

See FI 4701.

FI 4703 Independent Study 3 (3 q.h.)

See FI 4701.

FI 4800 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

FI 4801 Advanced Tutorial 2 (3 q.h.)

See FI 4800.

HEALTH INFORMATION ADMINISTRATION

Currently enrolled students should plan their course of study with the program director to avoid duplication of courses.

HIA 4300 Medical Terminology (4 q.h.)

Analysis and definition of medical terms. Study of anatomical, diagnostic, operative symptomatic and pathological terms relating to all body systems. *Prereq.* BIO 4161/4165, BIO 4162/4166, BIO 4163/4167 or permission of instructor.

HIA 4315 Health Information Administration 1 (3 q.h.)

Introduction to health information systems covering health information history, numbering, filing, security and the health information specialist's relationship to the health facility. Stresses quantitative and qualitative analysis of the health record with emphasis placed on licensing and accrediting standards for health records. Review of computerized applications used to support various health information systems. *Prereq.* BIO 4161/4165, BIO 4162/4166, BIO 4163/4167 or equiv. and HIA 4300.

HIA 4316 Health Information Administration 2 (3 q.h.)

Study of the preservation and retention of health records, the legal aspects of health information, the study of the basic principles of abstracting and compiling statistics for health care facilities, and the preparation of statistical reports and vital registration. *Prereq.* HIA 4315.

HIA 4328 Nomenclature and Classification 1 (3 q.h.)

Designed to develop basic student competencies in the use of ICD-9-CM and CPT coding systems, introduce the major coding systems used today in health care delivery systems, identify issues related to coding and data quality and the uses of coding for index development. Review use of encoding systems. *Prereq.* BIO 4161, BIO 4162, BIO 4163 or equiv., HIA 4300, HIA 4315 or instructor's permission.

HIA 4329 Nomenclature and Classification 2 (3 q.h.)

Designed to develop advanced student competencies in the use of ICD-9-CM coding system. Continuation of HIA 4328. *Prereq.* HIA 4328.

HIA 4335 Clinical Practicum 1 (3 q.h.)

First of three clinical practice affiliations will emphasize the technical aspects of health information administration. This clinical will include admitting procedures, health record analysis and retention, release of information, coding and indexing. *Prereq.* HIA 4316 and HIA 4329. Requires liability insurance coverage.

HIA 4336 Clinical Practicum 2 (2 q.h.)

The second of three clinical practice affiliations is designed to introduce students to non-traditional health information systems. Students affiliate at long term care facilities, community health centers, HMO's, mental health facilities, VNA's, etc. The health information needs of these facilities are emphasized. Students are also introduced to the role of the health information consultant within non acute care settings. *Prereq.* HIA 4400 and HIA 4335. Requires liability insurance coverage.

HIA 4337 Clinical Practicum 3 (3 q.h.)

The final clinical affiliation emphasizes the organizational and managerial aspects of health information systems. Students are required to do special management projects

under the direction of the clinical preceptor. Experience in Quality Management programs within hospitals and health care settings is also gained. *Prereq.* HIA 4431, HIA 4415 (formerly HIA 4410) and HIA 4336. *Requires liability insurance coverage.*

HIA 4400 Specialized Health Information Systems (3 q.h.)

Study of non-traditional aspects of health information administration. Special focus is on the management of health information systems in ambulatory, long term care, home care and psychiatric settings. Tumor registry is also studied. *Prereq.* HIA 4316 and HIA 4329.

HIA 4415 Health Care Quality Management (formerly HIA 4410) (3 q.h.)

Introduction to utilization management, PRO requirements, quality management and risk management in health facilities with emphasis on methodology for development of criteria and tool development and the performance of monitoring and evaluation of patient care, physician and provider performance. Evaluation on monitoring as current method of cost and quality control will also be addressed. *Prereq.* HIA 4400 or permission of instructor.

HIA 4430 Health Information Management 1 (3 q.h.)

Focus is on the organization and management of a Health Information Department within the health care setting. Stresses management principles and practices utilized in health information systems. Management skills necessary to develop organization charts, policies, job descriptions and job procedures are reviewed. The course is designed to develop the student's ability to plan, organize, actuate and control through the principles of management and the practice of health information administration. *Prereq.* HMG 4100, HIA 4329 and HIA 4400.

HIA 4431 Health Information Management 2 (3 q.h.)

Focus is on the management of Health Information Department within the health care setting. Emphasis is placed upon productivity within the hospital and the Health Information Department. Hospital and departmental budgeting, cost control mechanisms, forms design and office layout will also be reviewed. Review of contracting will also be studied. This course is a continuation of HIA 4430. *Prereq.* HIA 4430.

HIA 4500 Health Information Computer Systems (3 q.h.)

Introduction and review of current computer applications being used by Health Information Departments in traditional and alternative health care facilities. Emphasis is placed on information systems relating to health/patient records. Management of health information databases, software applications and systems selection. *Prereq.* COM 4101 and HIA 4400.

HIA 4520 Topics in Health Information Administration (3 q.h.)

Designed to include an extension and expansion of new or updated issues in Health Information Administration. Current issues will be introduced in a seminar fashion focusing on training and development, resume writing and interviewing techniques, stress management, classification and coding, data quality, health care finance and computer trends and application. *Prereq.* HIA 4415 (formerly HIA 4410), HIA 4500, HIA 4431.

HIA 4530 Health Care Systems/Computerized Patient Record Systems (formerly Health Information Systems Analysis) (3 q.h.)

Analysis and design of health information systems. Assessment and decision making applications of computer resources in patient/health information management. Concepts and current methods of computerizing patient/health records. *Prereq.* HIA 4431 and HIA 4500.

HIA 4700 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

HIA 4701 Advanced Tutorial 2 (3 q.h.)

See HIA 4700.

HIA 4800 Independent Study (3 q.h.)

Students will work with the Health Information Administration Program Director to select a topic and/or project to be extensively reviewed and studied. This independent study project is designed to give students the opportunity to explore in-depth a subject relevant to their interests. It is designed to give them the opportunity to study a problem, present a proposal, carry out a course of action and to prepare both a written and oral presentation of their activity. Students are

required to present their research to HIA faculty and fellow students using professional audiovisual aids. *Prereq.* HMG 4411 and HIA 4431.

HEALTH MANAGEMENT

HMG 4100 Managing Health Services Organizations 1 (formerly Hospital Organization and Management 1) (3 q.h.) *

Study of hospital organizational structure and administration. Focuses on the complex nature of health administration, its interdependent relationships and organizational strategy. *Prereq.* HMG 4301 or permission of the instructor.

HMG 4101 Managing Health Services Organizations 2 (formerly Hospital Organization and Management 2) (3 q.h.) *

Continuation of HMG 4100, emphasizing organizational issues and management techniques. *Prereq.* HMG 4100.

HMG 4103 Managing Health Services Organizations (Intensive) (formerly Hospital Organization and Management Intensive) (6 q.h.) *

Same as HMG 4100 and HMG 4101.

HMG 4106 First Aid Procedures (formerly REC 4105 Childhood Medical Procedures) (2 q.h.)

Explores emergency care/first aid and medical procedures for infants, children and adolescents who are in the care of professional parents in group homes, foster homes and day care facilities based on the practices of the American Red Cross and Standard of Care by Pediatricians. Prevention will be a major focus. *Not open to students who have taken REC 4105.*

HMG 4200 Health Science Statistics (3 q.h.)

This course introduces the gathering, display, interpretation and manipulation of data as well as the fundamentals of research design in the health care arena. Descriptive statistics such as mean, median, mode, standard deviation as well as sampling protocols will be addressed. Inferential statistics including the research and null hypothesis, confidence limits and the application of Chi-square and degrees of freedom are highlighted. The role and use of probability in sampling and application are also discussed.

Internal and external reporting needs as well as primary and secondary source documents will be studied. *Prereq.* MTH 4111, MTH 4107 or equiv.

HMG 4215 Health Law (3 q.h.)

Basic hospital legal issues relating to corporate and individual liability. Includes an analysis of consent and competency in health care, emphasizing bioethical questions raised by the removal of life-support systems. *Prereq.* HMG 4101 and HMG 4301.

HMG 4301 Health Care Delivery Systems (3 q.h.) *

The structure, function, and organization of health care services.

HMG 4304 Professional Caregiving 1 (formerly REC 4378 Parenting Skills 1) (3 q.h.)

Designed for both experienced and prospective parents/caregivers. It will reinforce and enhance methods that parents/caregivers have already developed to deal effectively with the care of children, adolescents and young adults. For those who feel less confident about their ability or experience, it will point the way to an effective, consistent, philosophical approach. *Not open to students who have taken REC 4378, REC 4379 or REC 4380.*

HMG 4305 Professional Caregiving 2 (formerly REC 4379 Parenting Skills 2) (3 q.h.)

Designed to help parents/caregivers understand and differentiate between psychotic and neurotic behaviors, as well as to identify the symptoms of the unattached child. Specific techniques will be taught that will help the caregiver work successfully with the child, and in the case of the severely disturbed child, adolescent and adult, to be able to work as part of a therapeutic team in a treatment plan. *Not open to students who have taken REC 4378, REC 4379, or REC 4380.*

HMG 4306 Professional Caregiving (Intensive) (formerly REC 4380 Parenting Skills Intensive) (6 q.h.)

Same as HMG 4304 and HMG 4305. *Not open to students who have taken REC 4378, REC 4379, or REC 4380.*

**It is strongly recommended that this course be taken at the beginning of the student's course of study.*

HMG 4310 Principles and Practices of Community Health 1 (3 q.h.)

Community health care activities. Emphasizes community health promotion and the coordination and integration of medical and self-care activities with the needs, goals, and resources of the community. *Prereq.* HMG 4101 and HMG 4301.

HMG 4311 Principles and Practices of Community Health 2 (3 q.h.)

Continuation of HMG 4310. Emphasizes specific community health problems. *Prereq.* HMG 4310.

HMG 4325 Health Planning and Regulation (3 q.h.)

Analysis of past and present interventions that affect the supply and demand side of the health care system at the community, state, regional, and national levels. Planning and regulations are discussed in the context of political considerations influencing their implementation and effectiveness. *Prereq.* HMG 4215.

HMG 4390 The Patient's Impact on Decision-Making (3 q.h.)

Explores some of the personal dimensions of illness and treatment and the nature of the relationships between ill people and those trying to care for them. Emphasis on how this interaction effects and influences health management decisions. *Prereq.* HMG 4101 and HMG 4301.

HMG 4400 Health Care Financial Management 1 (3 q.h.)

Introduction to health care financial management, including issues in fund accounting, control, and reimbursement. *Prereq.* FI 4301, HMG 4101 and HMG 4301.

HMG 4401 Health Care Financial Management 2 (3 q.h.)

Continuation of HMG 4400. *Prereq.* HMG 4400.

HMG 4411 Research for Managers (3 q.h.)

Provides students with an awareness of the research process and the scientific methods. Types of research design and appropriate approaches to research problems will be covered from both the perspective of a consumer of research data and from that of a person doing research in real world settings.

Emphasis will be placed on integrating the research process into the professional decision-making process in the real world. *Prereq.* HMG 4200 or equiv., HMG 4101 and HMG 4301.

HMG 4440 Health Care Operations Management (3 q.h.)

An applications-oriented case course focusing on selected operations management planning, restructuring, and control problems common to hospitals and other health service organizations. *Prereq.* HMG 4101 and HMG 4301.

HMG 4445 Health Care Marketing and Communication 1 (3 q.h.)

The "how" and "why" of marketing in health care. Presents basic principles, including formulating a marketing plan, strategic marketing practices, and specific marketing for specialized organizations such as HMOs and mental health nursing homes. *Prereq.* HMG 4101 and HMG 4301.

HMG 4446 Health Care Marketing and Communication 2 (3 q.h.)

Continuation and expansion of topics covered in HMG 4445. *Prereq.* HMG 4445.

HMG 4580 Information Processing in Health Care (3 q.h.)

Introduction to computer applications and management in health care facilities, including the evolution and application of computer use in health, clinical, and business information systems; patient care; management; public health; and reimbursement. The information flow of clinical and nonclinical patient data is applied to the principles of information system life-cycle development. The role of the health manager in selecting, implementing, and evaluating information systems for health care facilities is considered. *Prereq.* HMG 4101 and HMG 4301.

HMG 4600 Long-Term Care Administration 1* (6 q.h.)

Organization of care for the long-term and chronically ill patient. Examines the goals, purposes, and design of long-term care facilities as well as budgeting, financing, capital funding, and administration. *Prereq.* HMG 4101 and HMG 4301.

*Available 1996-97; offered every other year.

HMG 4601 Long-Term Care Administration 2* (6 q.h.)

Study of internal and external systems pertinent to the long-term care facility. Examines such topics as the nursing unit, the role of the physician, therapies, licensing agencies, hospitals, and methods for improving services. *Prereq.* HMG 4600 or *equiv.* or permission of the instructor.

HMG 4602 Long-Term Care Administration 3* (6 q.h.)

Examination of long-term care institutions and their impact on the health care industry. Considers the nature and problems of aging and the care of the elderly in the home, in the community, and in institutions. A general survey and summary of the Massachusetts Nursing Home Administrators Licensure Examination is included. *Prereq.* HMG 4601 or *equiv.* or permission of the instructor.

HMG 4610 Principles and Practices of Community Mental Health (3 q.h.)

Introduction to the principles of community mental health, emphasizing the development, implementation, operation, delivery, and use of community mental health services. *Prereq.* HMG 4101 and HMG 4301.

HMG 4652 Health Management Practicum 1 (4 q.h.)

Working in conjunction with a preceptor, the student performs independent work within an administrative setting. Projects include problem identification, data gathering, analysis of alternatives and implementation of a plan of action. *Students must have completed 75 percent of the degree requirements before registering for this course. Applications for registering must be submitted one full quarter prior to the desired starting date. Contact the program office at 617-373-5796 for direction sheet and petition form.*

HMG 4653 Health Management Practicum 2 (4 q.h.)

A continuation of HMG 4652.

HMG 4700 Advanced Tutorial 1 (3 q.h.)

Opportunity to take an upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

HMG 4701 Advanced Tutorial 2 (3 q.h.)

See HMG 4700.

HMG 4801 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details.

HMG 4802 Independent Study 2 (3 q.h.)

See HMG 4801.

HUMAN RESOURCES MANAGEMENT

HRM 4301 Organizational Behavior 1 (3 q.h.)

This course is designed to provide a fundamental presentation of the dynamics of organizational life. Emphasis is placed on individual and interpersonal behavior in a work setting. Primary focus is on managerial applications of the organizational sciences and included topics such as motivation, communications, and leadership.

HRM 4302 Organizational Behavior 2 (3 q.h.)

Expanding on the fundamentals of HRM 4301, this course highlights critical issues associated with a changing domestic and international work force, productivity, and development of effective organizational structures. Other topics include stress, counseling, employee rights, and group dynamics. *Prereq.* HRM 4301.

HRM 4304 Organizational Behavior Intensive 1 and 2 (6 q.h.)

Same as HRM 4301 and HRM 4302.

HRM 4309 Labor Relations (3 q.h.)

An examination of the development, current status and role of organized labor and management structures. The rights and responsibilities of employer organizations, individual employees and their influence on labor relations will be studied. Collective bargaining and grievance procedures will be introduced within the legal framework under which they function. Student participation will be required during case analysis and exercises.

HRM 4310 Human Resource Management (formerly Personnel Management 1) (3 q.h.)

Study of the role of the human resources manager and department. Particular focus on the techniques of employee forecasting, recruitment, compensation and employee relations. Case study and exercises will also deal with critical issues around affirmative action and employee safety.

**Available 1996-97; offered every other year.*

HRM 4321 Wage and Salary Administration (3 q.h.)

Wage and salary determination, including merit and incentive plans, wage and salary structure, compensation methods, and the impact of employer-employee relations on compensation systems.

HRM 4322 Employee Benefits (3 q.h.)

Study of private and public problems related to job and worker income security. Includes unemployment compensation, training and employment services, private guaranteed income, retirement pension plans, and disability and group insurance.

HRM 4325 Training and Development in Organizations (3 q.h.)

Explores the basics of training in a variety of settings in organizations. Special emphasis is placed on training and development as a human resource function by providing an overview of the principles of adult learning, needs assessment, goal setting, and design and evaluation.

HRM 4333 Employment Rights (3 q.h.)

This course examines the development and present status of laws and regulations affecting the U.S. work force. It examines basic employment concerns, from both the employee and employer perspective, such as hours of work, minimum wage, health and safety, as well as issues of access and opportunity, such as EEO, ADA, and Family and Medical Leave. Current court rulings, case studies and analysis will focus students on critical issues and challenges facing individuals, businesses and society entering the 21st century.

HRM 4334 Human Resource Information Systems (3 q.h.)

This course will explain the effective management of computer-based methods in such areas as workforce planning, skills inventory, payroll, and government report generation. Basic techniques of data collection and system design and implementation will be discussed. Students will learn to use information systems to solve human resource problems in a cost-effective manner.

HRM 4345 Comparative International Labor Relations Systems (3 q.h.)

Comparison and contrast of selected international labor relations systems with that of the United States, including recent develop-

ments such as worker participation and co-determination. Research and preparation of position paper by the student; class discussion. *Prereq.* HRM 4302.

HRM 4347 Managing People in International Settings (3 q.h.)

This course deals with effective human resource management in international and cross-cultural environments. The student will investigate the selection, orientation and training of personnel for work in multicultural environments. Focusing on the management of the international employee in the United States and abroad, effective cross-cultural communication and behavior will be stressed. *Prereq.* HRM 4302.

HRM 4348 The Changing Work Force (3 q.h.)

As we approach the 21st Century, a key word for businesses and individuals alike is change. Research and the popular press bombard us with predictions of increasing complexity in the workplace. In this course, students will consider the many effects of globalization, diversity, technological change, new work force arrangements. Strong consideration will be given to the individual and organizational skills necessary to function effectively in the midst of turbulence and transition.

HRM 4415 Leadership (Reserved) (3 q.h.)

In this course, the leadership function in a variety of organizational settings is studied. Using a contingency approach, students explore a range of possible leadership behaviors, relating the appropriateness of a particular style to a number of situational factors. Readings provide an opportunity to explore several contingency theories of leadership and cases allow for the application of these models. *Prereq.* HRM 4302 or HRM 4304 and 80 q.h.

HRM 4600 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

HRM 4601 Honors Program 2 (4 q.h.)

See HRM 4600.

HRM 4602 Honors Program 3 (4 q.h.)

See HRM 4600.

HRM 4701 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

HRM 4702 Independent Study 2 (3 q.h.)

See HRM 4701.

HRM 4703 Independent Study 3 (3 q.h.)

See HRM 4701.

HRM 4800 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

HRM 4801 Advanced Tutorial 2 (3 q.h.)

See HRM 4800.

HEALTH SCIENCE

HSC 4210 Basic Nutrition (3 q.h.)

Introduction to nutrition and foods. Focuses on current scientific knowledge of nutrition and how this knowledge can guide an individual toward making appropriate food choices.

HSC 4220 Basic Pharmacology (3 q.h.)

Introduction to the major classes of drugs. Presents the mode of action, common side effects, dosage, pharmaceutical forms, rate and route of administration, and known interactions and toxicities of the most commonly used drugs. *Prereq.* BIO 4163, CHM 4135, or equiv., or instructor's permission.

HSC 4301 Pathophysiology 1

(formerly Mechanisms of Disease 1) (3 q.h.) The pathophysiology of major diseases. Discusses diagnosis and treatment, emphasizing inflammation, immunology, infectious disease, oncology, endocrine disorders, and trauma. *Prereq.* BIO 4183 or equiv.

HSC 4302 Pathophysiology 2

(formerly Mechanisms of Disease 2) (3 q.h.) Continuation of HSC 4301, using an organ-system approach to disease. Emphasizes cardiovascular, gastro-intestinal, pulmonary, and musculo-skeletal diseases. *Prereq.* HSC 4301.

HSC 4310 Public Health 1 (3 q.h.)

Study of principles of public health and current mental and physical health problems. Includes communicable diseases, mental health, maternal and child health, official, voluntary, and international health organizations, and alcoholism. Also examines federal, state, and community resources mobilized to aid in prevention, identification, treatment, and rehabilitation.

HSC 4311 Public Health 2 (3 q.h.)

Continuation of HSC 4310. Includes environmental health, chronic diseases, preventive medicine, and public health education.

HSC 4315 Environmental Problems and Health (3 q.h.)

Environmental conditions on land and in the air and water, including the causes of pollution, its effects on human and other life, and a general discussion of current control methods. Emphasizes the significance of environmental problems for the individual.

HSC 4320 Training and Development in the Health Professions 1 (3 q.h.)

Educational program designed for the practitioner, including program planning, teaching strategies, and the development and evaluation of educational objectives.

HSC 4321 Training and Development in the Health Professions 2 (3 q.h.)

Continuation of HSC 4320. Emphasizes program implementation and evaluation and student motivation. *Prereq.* HSC 4320.

HSC 4350 Introduction to Environmental Health and Safety (3 q.h.)

This course highlights key aspects of the Environmental Health and Safety field. Topics include biological safety, chemical safety, industrial hygiene, general safety, toxicology, radiation protection, environmental protection, and hazardous waste management. Regulatory agencies such as the Occupational Safety and Health Administration (OSHA), the Nuclear Regulatory Commission (NRC), and the Environmental Protection Agency (EPA) will be discussed along with applicable regulatory requirements. *Prereq.* entry level chemistry and biology.

HSC 4352 Environmental Law (3 q.h.)

This course will cover the evolution of U.S. federal laws, regulations, and standards pertaining to occupational safety, health and environmental protection in the 20th century. Issues and incidents important to the development of OSHA, EPA, NRC, and the NIH Guidelines will be included. Cases decided by the U.S. Supreme Court in the 1980s which defined and clarified the rights and obligations of employers and employees will be included, as well as the interrelationships with state and local authorities. *Co-requisite with HSC 4350.*

HSC 4354 Loss Prevention and Fire Safety (3 q.h.)

This course expands upon the fundamental techniques of job safety analysis to non-occupational injuries, product safety, and property loss prevention. Life safety code, consumer product protection, and fire protection programs are reviewed as part of risk management.

HSC 4380 Mental Health and Counseling (3 q.h.)

This course is designed to assist students in becoming more willing and able to reach out to school age children from a base of self-understanding and to aid them in deepening their human capacity to recognize and respond to the emotional dimensions of many health-related situations. Additionally, the student will apply the knowledge gained in a school setting. *Prereq. PSY 4352 and PSY 4280.*

HSC 4401 Occupational Safety (3 q.h.)

This course introduces the fundamental concepts of designing and implementing safety programs for construction and general industry. Job safety analysis, safety management techniques, and regulatory requirements are reviewed through text readings and case studies for a variety of workplaces. *Prereq. HSC 4350.*

HSC 4402 Health Hazards of Workplace Environments (3 q.h.)

This course will cover how to recognize, evaluate, and control hazards of different industrial and workplace environments. General industry processes such as welding, machining, degreasing, electroplating, etc., will be discussed as well as the hazards of different types of production facilities (electronics, semiconductor, petroleum refining, pharmaceuticals, etc.). The hazards of hazardous waste sites and offices in sick buildings will also be reviewed. Field trips to three area industrial facilities will be arranged. *Prereq. HSC 4350.*

HSC 4403 Environmental Compliance (3 q.h.)

This course focuses on the major environmental problems and regulations that have developed over this last century. Requirements under the CAA, CWA, RCRA, SARA and CERCLA will be covered in depth. Various control technologies and industry practices as they relate to these regulations will

also be reviewed and discussed. Includes an overview of ISO 14000. *Prereq. HSC 4350.*

HSC 4404 Hazardous Waste Management (3 q.h.)

This course provides a comprehensive overview of the proper identification, management and disposal of infectious, radioactive, chemical and mixed wastes. Common industry practices and disposal technologies will be addressed for the various waste streams. Includes a review of generator status and waste minimization principles. *Prereq. HSC 4350.*

HSC 4475 Methods of School Health Education (3 q.h.)

This course is designed to assist the entry level health education in the development of competencies and skills necessary to function effectively in the health promotion fields. Major emphasis will be on concepts of planning and delivering health education programs.

HSC 4501 Industrial Toxicology (3 q.h.)

This course will present the principles of Toxicology with emphasis on workplace exposures. Route of exposure, dose-response relationship, types of toxicity and the modes of action of toxic substances will be covered. Workplace examples include exposure to air contaminants, metals, pesticides, carcinogens, and mutagens. Federal regulations and the basis for workplace standards are discussed, including threshold limit values and biological exposure indices. Sources of toxicological information are explored. *Prereq. BIO 4163, CHM 4135 and MTH 4120.*

HSC 4502 Industrial Hygiene Measurements (3 q.h.)

All aspects of general industrial hygienic practice will be covered including: how toxic substances behave in the workplace atmosphere, state-of-the-art measurement techniques for toxic exposures (gases, vapors, and particulates), calibration and use of air sampling equipment, and compliance with OSHA standards for chemical exposures. An overview and introduction to measurement of other workplace hazards (noise, heat, stress, radiation and ventilation) will also be covered. Lab sessions will cover use of calibration of instruments. *Prereq. HSC 4350 and MTH 4120.*

HSC 4503 Engineering Control of Chemical Hazards in the Workplace (3 q.h.)

Exposure to chemicals in the workplace needs to be controlled to below the OSHA permissible exposure limits. The preferred control method is by engineering methods, specifically general and local exhaust ventilation. This course will emphasize the design, selection, and performance evaluation of general and local exhaust ventilation systems. It will also cover non-engineering control methods such as personal protective equipment (respirators and protective clothing). *Prereq.* HSC 4350 and MTH 4120.

HSC 4504 Recognition and Control of Non-Chemical Hazards in the Workplace (3 q.h.)

Non-chemical hazards that need to be evaluated in the workplace include noise, heat and cold stress, and ionizing and non-ionizing radiation. This course will cover evaluation and measurement techniques and control of non-chemical hazards. Lab sessions of equipment calibration and use will be included. *Prereq.* PHY 4102 and MTH 4120.

HSC 4600 Advanced Nutrition (3 q.h.)

Study of food chemistry, nutrition, and physiology as applied to diet. Includes recent developments in normal nutrition and a critical review of the literature and experimental data on which principles of human nutrition are based. *Prereq.* HSC 4210.

HSC 4601 Advanced Pharmacology (3 q.h.)

Continuation of HSC 4220. Includes routes of administration of drugs, side effects, variations in potency and efficacy, structure and its relationship to toxicity, allergy, resistance and duration. Drug groups discussed include: Antineoplastic agents, bronchactive drugs, histamines and antihistamines, drugs affecting central respiratory center, muscle relaxants, anesthetics and vitamins. Contemporary drug abuse will be discussed. Also covered: synergism and antagonism. *Prereq.* HSC 4220 or *equiv.*

HSC 4610 Geriatric Nutrition (3 q.h.)

Integration of basic nutrition principles with the most current information on the aging process. Reviews state, local, and federal nutrition programs in terms of services, eligibility, and effect upon the elderly. *Prereq.* knowledge of basic nutrition or instructor's permission.

HSC 4700 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

HSC 4701 Advanced Tutorial 2 (3 q.h.)

See HSC 4700.

HSC 4706 Health Education Practicum

Allows for full-time participation in a university-arranged and supervised school program designed to analyze learning and teaching and to demonstrate, evaluate, and develop teaching skills at the appropriate level in Health Education. *Prereq.* Formal acceptance into program and completion of advanced professional sequence with a grade of at least C in each professional course and a minimum overall QPA of 2.500.

HSC 4801 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

HSC 4802 Independent Study 2 (3 q.h.)

See HSC 4801.

HSC 4803 Independent Study 3 (3 q.h.)

See HSC 4801.

HISTORY

HST 4101 The Civilization of the Ancient and Medieval Worlds (formerly History of Civilization 1) (3 q.h.)

Development of human institutions up to the end of the Middle Ages. Emphasizes the continuities and changes that occur within civilizations and the similarities, differences, and relationships that exist among contemporary civilizations around the world. Explores implications of each historical period for our lives today.

HST 4102 The Civilization of the Early Modern World (formerly History of Civilization 2) (3 q.h.)

The period from the end of the Middle Ages to the French Revolution in 1789. Emphasizes the intellectual, technological, and political expansion of Europe and the reactions of the rest of the world to it. Special attention is given to such topics as the rise of dynastic states, the rise and fall of mercantilism, the scientific revolution, exploration and gunpowder technology, and order and revolution.

HST 4103 The Civilization of the Modern World (formerly History of Civilization 3) (3 q.h.)

The world from 1789 to the present. Includes capitalism, industrialization, nationalism, imperialism, the clash of ideologies in the nineteenth century, and a study of total war in the present century. Based on this historical study, the prospects for the future will be explored.

HST 4110 History of Civilization A (4 q.h.)

Major ideas and institutions of civilizations from ancient times to 1648. *For Alternative Freshman-Year students only. Not open to students who have taken HST 4101 or HST 4102.*

HST 4111 History of Civilization B (4 q.h.)

Continuation of HST 4110, covering the period since 1648. *For Alternative Freshman-Year students only. Not open to students who have taken HST 4102 or HST 4103.*

HST 4201 American History 1763-1848

(formerly American History 1) (3 q.h.)
America from 1763 to 1848, with attention to the development of political, economic, and social institutions in the new republic.

HST 4202 American History 1848-1917

(formerly American History 2) (3 q.h.)
The United States from 1848 to 1917, with attention to the Civil War, economic development thereafter, and the Progressive Era.

HST 4203 American History Since 1917 (formerly American History 3) (3 q.h.)

The United States since 1917, an age of urbanized industrialism and international involvement and crisis.

HST 4241 The Historian's Craft (3 q.h.)

Discussion of ways in which the historian studies the past, with emphasis on research and writing.

HST 4263 Oral History (3 q.h.)

Learning history from those who lived it, students conduct tape-recorded interviews of first-hand experiences in a selected area of twentieth-century history. Students need access to an audiotape recorder. (Thematic Group B or E)

HST 4265 Introduction to Public History (3 q.h.)

Topics include the new discipline of public historical archiving, the construction of historical displays and exhibits, the preserva-

tion and restoration of historic sites and structures, the editing of historical documents and journals, the operation of historical societies, and the production of historical media programs.

HST 4270 History and Film (3 q.h.)

Explores the manner in which filmmakers use historical subjects for their projects and the ways in which historians analyze films as primary sources for research. Presents both dramatic and documentary films in combination with readings from various source and interpretive materials. This course meets for three hours each week. (Thematic Group D)

HST 4272 Topics in History on the Screen (3 q.h.)

Study of a topic or historical time period and how the topic or time period is portrayed in feature films. Students will study the topic and then compare the films with history. Films will be excerpted for class viewing; full-length films will be on reserve in the Library. Students may take this course more than once provided that they focus on a different topic each time. (Thematic Group depends on subject of course.)

HST 4301 Technological Transformations of Society (3 q.h.)

The relation between technological innovations and the world in which they take place. Discusses conditions necessary for discovery and innovation and the impact of technology on the political, economic, and social environment. (Thematic Group D)

HST 4302 History of Flight and Space Travel (3 q.h.)

Beginning with the ancient Greeks' and Leonardo da Vinci's dreams of flight, the course traces the history of nonpowered flight from the balloon experiments of the Montgolfier brothers to contemporary hang-gliders; of powered flight from the Wright brothers through supersonic transport; and of rocketry and space travel from their beginnings through the *Enterprise*. (Thematic Group D)

HST 4303 History of the Automobile (3 q.h.)

History of the automobile in Europe and America. Includes invention, production, impact on social and economic life, and the problems of pollution and energy. (Thematic Group D)

HST 4401 Ancient Middle East (3 q.h.)

Study of ancient cultures and peoples in the Middle East to the rise of Islam. (Thematic Group G)

HST 4403 History of the Jews 1 (3 q.h.)

Cultural and intellectual survey of the Jews from the end of antiquity to early modern times. (Thematic Group G)

HST 4404 History of the Jews 2 (3 q.h.)

Role and position of the Jews in modern history. (Thematic Group A)

HST 4407 Ancient Greece (3 q.h.)

Origin and development of Greek civilization. (Thematic Group G)

HST 4408 Ancient Rome (3 q.h.)

Ancient Roman civilization, emphasizing the rise of the Republic and the decline of the Empire. (Thematic Group G)

HST 4410 The Middle Ages (3 q.h.)

History of Europe from the fall of Rome to 1350. (Thematic Group G)

HST 4414 History of the Early Christian Church (3 q.h.)

The history of Christianity from the time of Christ to 800, with attention to Jewish-Christians, St. Paul, and the Papacy. (Thematic Group G)

HST 4415 The Age of Luther, Calvin, and Loyola (3 q.h.)

The Protestant and Catholic Reformations from intellectual, social, economic, political, and artistic perspectives from the later Middle Ages to 1648, with attention to historiography and conflicting interpretations. (Thematic Group G or H)

HST 4416 The Christian Church in Modern Times (3 q.h.)

The history of Christianity after the mid-seventeenth century, with attention to the rise of Protestant denominations, the impact of the Enlightenment, and the conflict between fundamentalism and modernism.

HST 4418 Renaissance Civilization (3 q.h.)

The Renaissance in Italy and northern Europe with attention to intellectual, religious, social, artistic, and economic developments and special emphasis on Renaissance art, literature, and science. *Not open to students who intend to receive credit for HST 4419.* (Thematic Group G or H)

HST 4423 Europe 1789-1870 (3 q.h.)

Europe from the French Revolution to the Franco-Prussian War with a stress on the struggles for liberalism and nationalism.

HST 4424 Europe 1870-1921 (3 q.h.)

Background of World War I, including nationalism, militarism, imperialism, and the alliance system, as well as the making of war and peace. (Thematic Group C)

HST 4425 Europe Since 1921 (3 q.h.)

Europe after World War I; World War II; the Cold War; and the efforts to unify the continent. (Thematic Group C)

HST 4434 Family History (3 q.h.)

History of the family in Europe and America from 1600 to the present. Includes the changing nature and role of the family, marriage and divorce, child rearing, and aging. (Thematic Group A or E)

HST 4435 Women in European History (3 q.h.)

Historical examination of the position and role of women in European life. (Thematic Group A or E)

HST 4446 Enlightenment and Romanticism (3 q.h.)

Examination of cultural history in Europe from the late seventeenth century to the first third of the nineteenth century, with attention to the process by which the Age of Romanticism replaced the Age of Enlightenment.

HST 4452 The French Revolution and Napoleon (3 q.h.)

Examines the nature of the French Revolution and the era of Napoleon, with attention to their impact on France and Europe and with special attention to historiography, conflicting interpretations, and contemporary documents. (Thematic Group H)

HST 4455 Ireland Since 1800 (3 q.h.)

The Irish question in British politics from the Act of Union to the present. (Thematic Group C)

HST 4460 Germany from Weimar to Auschwitz (3 q.h.)

Examination of Germany's history from 1918 to 1945, with special attention to the brilliance of the Weimar cultural revolution and its later persecution by the Nazis, the appeal of Nazism and the Third Reich, the roots of anti-Semitism and racism, and World War II and the Holocaust. (Thematic Group C)

HST 4461 The Holocaust (3 q.h.)

An historical and sociological examination of the genocide perpetrated by the Nazis during World War II, its antecedents, theoretical and technological underpinnings, and mechanisms. Attention will also be paid to the attitudes and actions of the surrounding populations, of Germany's friends and enemies, and of the world since the end of that war. (Thematic Group C)

HST 4466 Eastern Europe Since 1500 (3 q.h.)

An examination of the salient historical factors which have driven the evolution of Eastern Europe from the Congress of Buda in 1500 which allied Poland and Hungary in anticipation of German and Russian encirclement through the fateful year 1989 which introduced the end of the Iron Curtain and post-World War II domination by the Soviet Union. (Thematic Group C)

HST 4468 Russia Since 1917 (3 q.h.)

Russian domestic affairs and international relations from the revolutions of 1917 to the present, with special attention to the rise and ultimate fall of Communism. (Thematic Group C)

HST 4470 History of Communism in the Twentieth Century (3 q.h.)

Examination of modern scientific socialism, generally known as communism, with special reference to its history in the Soviet Union, Eastern Europe, China, Cuba, and elsewhere and to the reasons for its rise, expansion, and decline. (Thematic Group C)

HST 4473 Poland in the Twentieth Century (3 q.h.)

Examines forces leading to Poland's national resurrection in 1918 after more than a century of being a nation without sovereignty; the interwar years of reconstruction and consolidation; partition and near annihilation by Hitler and Stalin in World War II; Cold War engulfment by Communism; Solidarity and the achievement of freedom. (Thematic Group C)

HST 4501 Native Americans (3 q.h.)

Survey of native Americans from pre-Columbian times to the present. (Thematic Group A)

HST 4502 Colonial America (3 q.h.)

Topics include exploration and settlement of North America; the development of political, social, and economic institutions; and the international rivalry to 1763. (Thematic Group H)

HST 4503 The American Revolution (3 q.h.)

British-American relations after 1763; war and peace. (Thematic Group H)

HST 4505 The Making of the American Constitution (3 q.h.)

Beginning with the weaknesses of the Articles of Confederation, this course examines the movement for a stronger national government, the drafting of the Constitution and the first twelve amendments, and their implementation in the early years of the Republic. (Thematic Group H)

HST 4506 American Constitutional History, 1835-1910 (3 q.h.)

American constitutional development in the time of Chief Justice Taney; the constitutional impacts of secession and Civil War; post-Civil War Supreme Court cases involving economic affairs, social problems, and individual rights in the terms of Chief Justices Chase, Waite, and Fuller. (Thematic Group H)

HST 4507 American Constitutional History Since 1910 (3 q.h.)

American constitutional development from the Progressive Era to the present, with attention to amendments to the Constitution, the growth of the national government, and Supreme Court cases involving economic affairs, civil liberties, and civil rights. (Thematic Group C)

HST 4511 Populism and Progressivism (3 q.h.)

Topical history of the United States from 1890 to 1920, concentrating on its reactions to industrialization and urbanization. (Thematic Group C)

HST 4512 The Age of Roosevelt (3 q.h.)

Topical history of the United States in time of world war, prosperity, depression, and war again. (Thematic Group C)

HST 4513 Contemporary America (3 q.h.)

The American people from the close of World War II to the present. (Thematic Group C)

HST 4518 History of Social Welfare in America (3 q.h.)

The history of private and public relief of the poor and needy in America from colonial times to the present. (Thematic Group B, C, or H)

HST 4523 American Diplomatic History (3 q.h.)

Selected topics in the history of American foreign relations and policy since 1789. (Thematic Group C or H)

HST 4530 American Economic History (3 q.h.)

Selected topics in the development of the capitalist economy in the United States, with attention to the role of government since 1789. (Thematic Group B, C, or H)

HST 4531 American Business History (3 q.h.)

Examines the rise of business in America, the role of the corporation, horizontal and vertical combinations, business and labor, and business and government. (Thematic Group B, C, or H)

HST 4535 History of the American Film Industry (3 q.h.)

The production, distribution, and exhibition of feature films in America from the 1890s to the present, with emphasis on the development of studios in California, the rise and fall of the contract system, censorship, government regulation, and foreign investment. (Thematic Group B, C, or D)

HST 4536 American Radio History (3 q.h.)

Radio in America from the days of Marconi to the present, with emphasis on the coming of commercial stations, the rise of networks, government regulation, the golden age of radio programs, the impact of television, and the nature of radio at the end of the twentieth century. (Thematic Group B, C, or D)

HST 4537 American Television History (formerly HST 4306) (3 q.h.)

Examines the evolution of the medium from the 1920s to the present with emphasis on the development of networks, programming, advertising, the impact of cable, and television's regulatory structure. (Thematic Group B, C, or D)

HST 4540 American Social History (3 q.h.)

Selected topics in the life of the American people since 1789. (Thematic Group B or E)

HST 4541 The Italian Experience in America (3 q.h.)

The Italian presence in America from earliest times to the present, with attention to exploration, immigration, and later generations. Fiction, videos, and taped interviews will supplement historical texts. (Thematic Group B)

HST 4542 Women in American History (3 q.h.)

Historical examination of the position and role of women in American life. (Thematic Group B or E)

HST 4543 African-American History (3 q.h.)

History of African Americans from colonial times to the present. (Thematic Group A)

HST 4547 History of Sport in America (3 q.h.)

History of the major sports and their impact on American life. (Thematic Group B, C, or H)

HST 4548 American Heroes (3 q.h.)

Comparative exploration of the nature and functions of heroism in American history, using such individuals as George Washington, Jesse James, Amelia Earhart, Martin Luther King, and Bruce Springsteen as specific case studies. (Thematic Group B, C, or H)

HST 4550 Boston to 1822 (3 q.h.)

Study of the Town of Boston from its establishment in 1630 to 1822 and the development of political, economic, and social institutions. (Thematic Group H)

HST 4551 Boston Since 1822 (3 q.h.)

Study of the City of Boston, its annexations, and the changes in the ethnic nature of the population. (Thematic Group C)

HST 4563 History of Criminal Justice in America (3 q.h.)

The history of crime and punishment in America from colonial times to the present. (Thematic Group B, C, or H)

HST 4602 Contemporary Latin America (3 q.h.)

Social, economic, and political development of the Latin American republics in the twentieth century. (Thematic Group A or C)

HST 4603 The United States, Central America, and the Caribbean (3 q.h.)

Latin American countries nearest the United States and most affected by U.S. policies, particularly Cuba, Mexico, Nicaragua, El Salvador, and Guatemala. Emphasizes the historical background of current issues. (Thematic Group C)

HST 4604 Mexico Since 1848 (3 q.h.)

Political, economic, social, and cultural evolution of Mexico since the Mexican-American War. Other topics and issues include the *Juarez Reforma*, Diaz's dictatorship, the Revolution of 1910, and the on-going Institutional Revolution. (Thematic Group A or C)

HST 4611 Africa Since 1885 (3 q.h.)

The European impact on Africa, the rise of African nationalism, and the emergence of independent African states and their relations with other nations. (Thematic Group A or C)

HST 4622 Modern Middle East (3 q.h.)

The Middle East since 1914, with attention to Zionism, Pan-Arabism, the effects of two world wars, and the postwar settlements. (Thematic Group A or C)

HST 4632 China Since 1850 (3 q.h.)

A century of China's history, emphasizing the Western impact on Chinese civilization, China's struggle to maintain independence, and the victory of communism in the mid-twentieth century. (Thematic Group A or C)

HST 4636 Japan Since 1850 (3 q.h.)

Analysis of Japanese domestic developments and foreign relations since the mid-nineteenth century. (Thematic Group A or C)

HST 4640 Third World Women (3 q.h.)

Role of women in the less developed, Third World areas, with special emphasis on aspects of change, development, and continuity. (Thematic Group C or E)

HST 4644 War and Peace in the Nuclear Age (3 q.h.)

The history of the nuclear age based on a Corporation for Public Broadcasting/Annenberg telecourse. By incorporating a variety of perspectives on the nuclear past—political, historical, philosophical, and scientific—the programs, lectures, and accompanying print materials provide students with a solid foundation of knowledge upon which they can base their views of the nuclear future. (Thematic Group C or D)

HST 4645 History of the Vietnam Wars (3 q.h.)

History of military conflict in Vietnam, with attention to the rise of the Viet Minh during World War II, the struggle against the French in the first Indochina War, the impact of the Cold War, and the involvement of the United

States after 1950 in Laos and Cambodia (now Kampuchea) as well as in Vietnam. Emphasizes the role of communism and nationalism in Indochina and the motives for American intervention. Includes films revealing American reaction to the escalating conflict. (Thematic Group C)

HST 4646 The Legacy of the Vietnam Wars (3 q.h.)

Examines the impact of the American involvement in Vietnam on American foreign and domestic policy as well as on American attitudes toward themselves and toward the world in the period since 1975. Emphasis will be placed on post-war interpretations of that conflict, on its effects on American ideals, on ideas of military preparedness, on the economy, on popular culture, and on the "healing processes" that have marked the last decade. An assessment of the extent to which Vietnam continues to haunt the American people and the extent to which the country has put the experience behind it will be made and an agenda for future action set forth by the class. (Thematic Group C)

HST 4650 Topics in European History (3 q.h.)

Topics may vary from year to year. Thematic Group designations will also vary.

HST 4651 Topics in American History (3 q.h.)

Topics may vary from year to year. Thematic Group designations will also vary.

HST 4653 Topics in Local History (4 q.h.)

Topics may vary from year to year. Thematic Group designations will also vary.

HST 4811 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

HST 4812 Honors Program 2 (4 q.h.)

See HST 4811.

HST 4813 Honors Program 3 (4 q.h.)

See HST 4811.

HST 4815 Advanced Tutorial 1 (3 q.h.)

Opportunity to take an upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

HST 4816 Advanced Tutorial 2 (3 q.h.)

See HST 4815.

HST 4821 Field Work in History (6 q.h.)
Designed to enhance career development by allowing students to earn credit for the application of their academic backgrounds to practical problems in the workplace. See page 24 for details. *Prereq.* HST 4101, 4102, 4103, 4202, 4203, 4241, and Program Director's approval.

HST 4822 Independent Study 1 (3 q.h.)
Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

HST 4823 Independent Study 2 (3 q.h.)
See HST 4822.

HST 4824 Independent Study 3 (3 q.h.)
See HST 4822.

HOTEL AND RESTAURANT MANAGEMENT

HTL 4301 Introduction to Hotel and Restaurant Management (3 q.h.)
The hospitality industry in today's economy. Emphasis is on industry growth and development, management problems, and principles of hotel and restaurant management.

HTL 4303 Front Office Management (3 q.h.)
Role and functions of the front office as they relate to the operation of the entire hotel. Covers front office structure, registration, payment, reservations, and night audit.

HTL 4304 Hotel and Restaurant Law (3 q.h.)
Introduction to the fundamental laws, rules, and regulations applicable to the hospitality industry. Includes hospitality management policies that minimize the danger of legal liability; innkeeping; restaurant management; alcoholic beverage control; labor laws; and legislation affecting the hospitality industry.

HTL 4305 Food Preparation 1 (3 q.h.)
Introduction to the fundamentals of food preparation and service, with emphasis on food service industry terminology and equipment. Includes menu planning, requisitioning, pricing, and preparation and service. In addition to classroom instruction, students prepare food in a small-quantity laboratory. (*Laboratory fee.*)

HTL 4306 Food Preparation 2 (3 q.h.)
Continuation of HTL 4305. *Prereq.* HTL 4305. (*Laboratory fee.*)

HTL 4307 Food Service Sanitation (3 q.h.)
Organization of the maintenance and engineering function. Includes the technical information necessary to establish effective preventive programs. Details the fundamentals of sanitation for food service employees and includes practical guidelines for safe food handling. Provides the future hospitality manager with an opportunity for certification in Applied Food Service Sanitation from the National Institute for the Food Service Industry.

HTL 4308 Food and Beverage Cost Control (3 q.h.)
Introduction to management attitudes toward cost controls through analysis of all aspects of the food service operation. Includes classification of food service facilities, cost accounting, purchasing, inventory, production control methods, and the essentials of food and beverage controls. Develops management-mindedness through examination of organizational structures of food service and specific topics, such as menu pricing, break-even analysis, and cost-volume-profit theory. Emphasizes forecasting and achieving a profitable bottom line.

HTL 4309 Managerial Accounting for the Hospitality Industry (3 q.h.)
Financial practices and systems used in the hospitality industry. Analyzes controls, budgeting, financial statements, and specialized industry accounting procedures. *Prereq.* ACC 4102.

HTL 4310 Hospitality Marketing Management (3 q.h.)
The market in which the hospitality industry operates. Students have the opportunity to develop and implement a marketing plan to meet operational goals. *Prereq.* MKT 4301.

HTL 4313 Introduction to Tourism (3 q.h.)
Introduction to the science, art, and business of attracting, transporting, and accommodating visitors and graciously catering to their needs and wants. Includes sociological and psychological aspects, marketing, and the economics of tourism.

HTL 4320 Food Preparation (Intensive) (6 q.h.)
Same as HTL 4305 and HTL 4306. (*Laboratory fee.*)

HTL 4322 Consumer Food Preparation
(3 q.h.)

Concepts and skills learned in HTL 4305 and HTL 4306 are applied in a restaurant setting. Preparation of complete menus for a service dining room, including appetizers, soups, salads, entrees, vegetables, and desserts. Stresses costing, menu planning, quantity recipe production, menu terminology, and kitchen organization. Coordinates food production with students in the dining room service course (HTL 4324). Work in a classic kitchen stations on a rotating basis. *Prereq.* HTL 4306 or HTL 4320. (Laboratory fee.)

HTL 4324 Dining Room Beverage Operation and Preparation (3 q.h.)

Introduction to the operation of a dining room with beverage service. Includes organization, personnel, methods of table service, menu terminology, table arrangement, requirements for supplies and equipment, sales promotion techniques, and revenue control. Students serve meals prepared by students in the food production course (HTL 4322). Also covers wine service and alcoholic beverage preparation and control. (Laboratory fee.) *Prereq.* HTL 4301.

HTL 4331 Professional Chef's Training
(formerly HTL 4325 Intensive Chef's Training) (6 q.h.)

This course is for the individual who already has a culinary background and wishes to continue to upgrade his/her skills and understanding of the changing role of today's food industry. The course explores two avenues, a greater understanding between chef and management, along with the preparation of finer cuisine for hotels, restaurants, clubs, catering and buffet. The practical demonstrations will include hors d'oeuvres through fancy desserts. Tableside and wine cookery, ice carving and extensive menu planning will be included. An all-round way to gain more culinary expertise. (Laboratory fee.)

HTL 4600 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

HTL 4601 Honors Program 2 (4 q.h.)
See HTL 4600.

HTL 4602 Honors Program 3 (4 q.h.)
See HTL 4600.

HTL 4701 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

HTL 4702 Independent Study 2 (3 q.h.)

See HTL 4701.

HTL 4703 Independent Study 3 (3 q.h.)

See HTL 4701.

HTL 4800 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

HTL 4801 Advanced Tutorial 2 (3 q.h.)

See HTL 4800.

INTERDISCIPLINARY

INT 4200 Workshop in Creativity (formerly The Creative Process) (3 q.h.)

Thought processes that allow individuals to be creative or original in all areas of life. Through interactive exercises and special projects in composition and problem-solving, students can learn how to tap their own creativity. Students are asked to create an original piece of art, music, literature, or research.

INT 4203 Independent Study in Cultural Heritage (3 q.h.)

Student will work one-on-one with a faculty member to complete a project he/she designs to study the interconnected ways in which art, music, literature, religion, and specific historical events have shaped our culture, values, and self-perceptions. Projects should deal with one or more themes included in Cultural Heritage studies for Liberal Studies B.A. degree (see page 127). *Prereq.* 27 q.h. in Cultural Heritage Studies or instructor's permission. Open only to Liberal Studies degree candidates.

INT 4400 Paralegal Studies (12 q.h.)*

This comprehensive certificate course, completed in one academic quarter, teaches a basic understanding of the law and responsibilities and duties of paralegal work. Practical workshop sessions and case study methods are used to teach the basics of probate, real estate, corporations, litigation, legal re-

*This program is offered at a tuition rate different from University College's. Please call 617-320-8024 for more information.

search, and legal ethics. Each subject area is taught by an attorney/paralegal team who are practicing professionals in that area of law. Attorneys teach the legal system and legal theory while paralegals focus on building skills that are applicable and relevant to paralegal work. The curriculum reflects the demands of a busy general law practice, and students who are considering law and paralegal work will receive instruction that will present the pace and atmosphere of a law office. The instructors are working professionals in their legal specialties. Students who complete all of the content areas of the program with at least a grade of B- will earn a certificate of successful completion. *Prereq.* 140 q.h., 3.0 q.p.a., and formal admission.

JOURNALISM

JRN 4112 Writing for Media 1 (formerly Fundamentals of Newswriting) (3 q.h.) Introduction to how to write leads, organize basic news stories, gather facts, and interview. Analyzes news values and the structure of news organizations.

JRN 4113 Writing for Media 2 (formerly Newsgathering and Reporting) (3 q.h.) Writing of multisource stories, both news and feature; public affairs reporting; advanced interviewing techniques; and legal issues. *Prereq.* JRN 4112 or instructor's permission.

JRN 4114 News Reporting Techniques (3 q.h.) Introduction to writing in-depth stories requiring significant research and introduction to investigative reporting. Includes libel, privacy invasion, and other legal matters affecting news media. *Prereq.* JRN 4113 or instructor's permission.

JRN 4300 Photojournalism (3 q.h.) Introduction to how to use the camera, the negative, and the print in news or feature stories. Includes weekly photo shooting assignments.

JRN 4330 The Newspaper Cartoon: Its Techniques and History (3 q.h.) How the political cartoon and comic strip have influenced American culture from the late 1800s through the 20th century. This course is for those interested in the political scene as well as those interested in careers in cartooning. Being an artist is not a prerequisite.

JRN 4335 Public Relations Basics (3 q.h.) Concepts, components, and methods of public relations, including planning and research, processes of influencing public opinion, and policies concerning corporate and institutional relations with the media and various publics.

JRN 4336 Public Relations Practice (3 q.h.) Study of specific practices and techniques employed in public relations, especially in relation to the handling of information and organization of activities and events. Also discusses how to define PR "targets" and how to deal with such publics as employees, stockholders, and consumers.

JRN 4337 Public Relations Problems (3 q.h.) Research and communication techniques used to solve public relations problems and practical experience with individual PR projects, programs, and campaigns.

JRN 4341 Mass Media and the Law (3 q.h.) Examination of libel, privacy, protection of sources and broadcast regulation. Conflicts between journalists and jurists over prior restraint, access to government information, and fundamental First Amendment issues also are discussed. Students will be expected to complete a research assignment in a law library.

JRN 4349 Advertising Basics (3 q.h.) Study of the evolution of advertising, including social, economic, and legal aspects; how advertising agencies and departments function; how advertising fits into the marketing mix; and the basic steps of research.

JRN 4350 Advertising Copywriting (3 q.h.) Writing effective advertising copy for both print and electronic media; coordinating copy with other creative functions. Elements of good ad copy are analyzed and common pitfalls are reviewed.

JRN 4351 Advertising Practice (3 q.h.) Study of media planning and selection. Includes defining objectives and determining target audiences; establishing the advertising budget; analyzing the market and the competition. *Prereq.* JRN 4349 or instructor's permission.

JRN 4480 Copyediting (3 q.h.) Practice in the many facets of the editorial process, including editing copy, writing heads, and laying out pages. The course also includes photo selection, cropping, and outline writing. *Prereq.* JRN 4112.

JRN 4522 Magazine Writing (3 q.h.)

Practice in writing and freelancing magazine articles. Analysis of magazine markets, preparation of query letters, techniques of research, and submission of manuscript. Travel, how-to, profile, personal experience, and other popular and salable formats.

JRN 4815 Advanced Tutorial 1 (3 q.h.)

Opportunity to take an upper-level course independently. See page 24 for details.

JRN 4816 Advanced Tutorial 2 (3 q.h.)

See JRN 4815.

LANGUAGE — FRENCH

LNF 4101 Conversational French 1 (formerly Elementary French 1) (4 q.h.)

Essentials of grammar, practice in pronunciation, and progressive acquisition of a basic vocabulary and idiomatic expressions.

LNF 4102 Conversational French 2 (formerly Elementary French 2) (4 q.h.)

Continuation of grammar study, with oral and written exercises. *Prereq.* LNF 4101 or *equiv.*

LNF 4103 Conversational French 3 (formerly Elementary French 3) (4 q.h.)

Reading of French prose of increasing difficulty, with written and oral exercises based on the materials read and practice in conversation. *Prereq.* LNF 4102 or *equiv.*

LNF 4104 Intermediate French 1 (4 q.h.)

Review of grammar, with practice in composition and conversation. *Prereq.* LNF 4103 or *equiv.*

LNF 4105 Intermediate French 2 (4 q.h.)

History of French civilization, with discussions and conversation. *Prereq.* LNF 4104 or *equiv.*

LNF 4106 Intermediate French 3 (4 q.h.)

Intensive reading of modern French prose, with practice in conversation. *Prereq.* LNF 4105 or *equiv.*

LNF 4225 Culture of the European Economic Community (3 q.h.)

By studying the cultural differences among members of the EEC such as cultural history, education, work ethic, male-female relations, and other areas, students will learn how to do business in this new market.

LNF 4815 French Advanced Tutorial 1 (4 q.h.)

Advanced Tutorial Option: When a student is unable to continue study of an upper-level language, or when a language course needed for a degree is not scheduled at appropriate intervals, arrangements can be made for the student to take three advanced tutorials for a total of twelve quarter hours. See page 24 for details. *Prereq.* 87 q.h.

LNF 4816 French Advanced Tutorial 2 (4 q.h.)

See LNF 4815.

LNF 4817 French Advanced Tutorial 3 (4 q.h.)

See LNF 4815.

LANGUAGE — GERMAN

LNG 4101 Conversational German 1

(formerly Elementary German 1) (4 q.h.)

Essentials of grammar, practice in pronunciation, and progressive acquisition of a basic vocabulary and idiomatic expressions.

LNG 4102 Conversational German 2

(formerly Elementary German 2) (4 q.h.)

The more difficult points of grammar, particularly the uses of the subjunctive mood. *Prereq.* LNG 4101 or *equiv.*

LNG 4103 Conversational German 3

(formerly Elementary German 3) (4 q.h.)

Reading of simple German prose, with oral and written exercises based on material read. Conversation in German is encouraged. *Prereq.* LNG 4102 or *equiv.*

LNG 4104 Intermediate German 1 (4 q.h.)

Review of grammar, with practice in composition and conversation. *Prereq.* LNG 4103 or *equiv.*

LNG 4105 Intermediate German 2 (4 q.h.)

History of German civilization, with discussions and conversation. *Prereq.* LNG 4104 or *equiv.*

LNG 4106 Intermediate German 3 (4 q.h.)

Intensive reading of modern German prose, with practice in conversation. *Prereq.* LNG 4105 or *equiv.*

LNG 4815 German Advanced Tutorial 1 (4 q.h.)

Advanced Tutorial Option: When a student is unable to continue study of an upper-level language, or when a language course needed for a degree is not scheduled at appropriate intervals, arrangements can be made for the student to take three advanced tutorials for a total of twelve quarter hours. See page 24 for details. *Prereq.* 87 q.h.

LNG 4816 German Advanced Tutorial 2 (4 q.h.)

See LNG 4815.

LNG 4817 German Advanced Tutorial 3 (4 q.h.)

See LNG 4815.

LANGUAGE — ITALIAN**LNI 4101 Conversational Italian 1** (formerly Elementary Italian 1) (4 q.h.)

Essentials of grammar, practice in pronunciation, and progressive acquisition of a basic vocabulary and idiomatic expressions.

LNI 4102 Conversational Italian 2 (formerly Elementary Italian 2) (4 q.h.)

Continuation of grammar study, with oral and written exercises. *Prereq.* LNI 4101 or *equiv.*

LNI 4103 Conversational Italian 3 (formerly Elementary Italian 3) (4 q.h.)

Reading of Italian prose of increasing difficulty, with written and oral exercises based on the material read. Practice in conversation. *Prereq.* LNI 4102 or *equiv.*

LNI 4104 Intermediate Italian 1 (4 q.h.)

Review of grammar, with practice in composition and conversation. *Prereq.* LNI 4103 or *equiv.*

LNI 4105 Intermediate Italian 2 (4 q.h.)

History of Italian civilization, with discussions and conversation. *Prereq.* LNI 4104 or *equiv.*

LNI 4106 Intermediate Italian 3 (4 q.h.)

Intensive reading of modern Italian prose, with practice in conversation. *Prereq.* LNI 4105 or *equiv.*

LNI 4815 Italian Advanced Tutorial 1 (4 q.h.)

Advanced Tutorial Option: When a student is unable to continue study of an upper-level language, or when a language course needed

for a degree is not scheduled at appropriate intervals, arrangements can be made for the student to take three advanced tutorials for a total of twelve quarter hours. See page 24 for details. *Prereq.* 87 q.h.

LNI 4816 Italian Advanced Tutorial 2 (4 q.h.)

See LNI 4815.

LNI 4817 Italian Advanced Tutorial 3 (4 q.h.)

See LNI 4815.

LANGUAGE — JAPANESE**LNJ 4101 Conversational Japanese 1**

(formerly Elementary Japanese 1) (4 q.h.)
Basic, practical Japanese, emphasizing the essentials of grammar, pronunciation, progressive acquisition of a core vocabulary, and the use of current, idiomatic expressions.

LNJ 4102 Conversational Japanese 2

(formerly Elementary Japanese 2) (4 q.h.)
Continuation of LNJ 4101. Progressive acquisition of practical skills. *Prereq.* LNJ 4101 or *equiv.*

LNJ 4103 Conversational Japanese 3

(formerly Elementary Japanese 3) (4 q.h.)
Continuation of LNJ 4102. *Prereq.* LNJ 4102.

LNJ 4104 Intermediate Japanese 1 (4 q.h.)

Review of grammar, with practice in composition and conversation. *Prereq.* LNJ 4103 or *equiv.*

LNJ 4105 Intermediate Japanese 2 (4 q.h.)

History of Japanese civilization, with discussions and conversation. *Prereq.* LNJ 4104 or *equiv.*

LNJ 4106 Intermediate Japanese 3 (4 q.h.)

Intensive reading of Japanese prose, with practice in conversation. *Prereq.* LNJ 4105 or *equiv.*

LNJ 4225 Japanese Culture (3 q.h.)

By studying various aspects of Japanese cultural history, education, work ethics, male-female relations, and other areas, students gain insight into the Japanese mentality and how this homogeneous race is surviving in a heterogeneous world.

LNJ 4815 Japanese Advanced Tutorial 1 (4 q.h.)

Advanced Tutorial Option: When a student is unable to continue study of an upper-level

language, or when a language course needed for a degree is not scheduled at appropriate intervals, arrangements can be made for the student to take three advanced tutorials for a total of twelve quarter hours. See page 24 for details. *Prereq.* 87 q.h.

LNJ 4816 Japanese Advanced Tutorial 2 (4 q.h.)
See LNJ 4815.

LNJ 4817 Japanese Advanced Tutorial 3 (4 q.h.)
See LNJ 4815.

LANGUAGE — RUSSIAN

LNR 4101 Conversational Russian 1 (formerly Elementary Russian 1) (4 q.h.)
Essentials of grammar, practice in pronunciation, and progressive acquisition of a basic vocabulary and idiomatic expressions.

LNR 4102 Conversational Russian 2 (formerly Elementary Russian 2) (4 q.h.)
Continuation of grammar study, with oral and written exercises. *Prereq.* LNR 4101 or *equiv.*

LNR 4103 Conversational Russian 3 (formerly Elementary Russian 3) (4 q.h.)
Reading of Russian prose of increasing difficulty, with written and oral exercises based on the material read and practice in conversation. *Prereq.* LNR 4102 or *equiv.*

LNR 4225 Russian Culture and Society (3 q.h.)
Study of various aspects of Russian cultural history, education, work ethics, male-female relations, and other areas, for insight into the Russian mentality.

LNR 4815 Russian Advanced Tutorial 1 (4 q.h.)
Advanced Tutorial Option: When a student is unable to continue study of an upper-level language, or when a language course needed for a degree is not scheduled at appropriate intervals, arrangements can be made for the student to take three advanced tutorials for a total of twelve quarter hours. See page 24 for details. *Prereq.* 87 q.h.

LNR 4816 Russian Advanced Tutorial 2 (4 q.h.)
See LNR 4815.

LNR 4817 Russian Advanced Tutorial 3 (4 q.h.)
See LNR 4815.

LANGUAGE — SPANISH

LNS 4101 Conversational Spanish 1 (4 q.h.)
Acquisition of basic oral skills by introduction of the essentials of Spanish grammar. Extensive practice in pronunciation and acquisition of an idiomatic core vocabulary.

LNS 4102 Conversational Spanish 2 (4 q.h.)
Continuation of LNS 4101. Introduces Spanish prose of moderate difficulty. *Prereq.* LNS 4101 or *equiv.*

LNS 4103 Conversational Spanish 3 (4 q.h.)
Continuation of LNS 4102. Continued stress on conversation, while building a solid vocabulary. *Prereq.* LNS 4102 or *equiv.*

LNS 4104 Intermediate Spanish 1 (4 q.h.)
Review of grammar, with practice in composition and conversation. *Prereq.* LNS 4103 or *equiv.*

LNS 4105 Intermediate Spanish 2 (4 q.h.)
Examination of Spanish civilization through texts of average difficulty. Intensive reading of modern prose, with occasional oral or written translation and conversation practice based on assigned readings. *Prereq.* LNS 4104 or *equiv.*

LNS 4106 Intermediate Spanish 3 (4 q.h.)
Examination of Spanish-American civilization through texts of average difficulty. Intensive readings of modern prose, with occasional oral or written translations and conversation practice based on assigned readings. *Prereq.* LNS 4105 or *equiv.*

LNS 4200 Spanish for the Medical Professions (4 q.h.)
Students are introduced to the specialized discourse of the medical professions. The differences between oral and written language styles will be addressed, as well as the differing requirements for levels of style, ranging from informal to formal.

LNS 4815 Spanish Advanced Tutorial 1 (4 q.h.)
Advanced Tutorial Option: When a student is unable to continue study of an upper-level language, or when a language course needed for a degree is not scheduled at appropriate intervals, arrangements can be made for the student to take three advanced tutorials for a total of twelve quarter hours. See page 24 for details. *Prereq.* 87 q.h.

LNS 4816 Spanish Advanced Tutorial 2
(4 q.h.)
See LNS 4815.

LNS 4817 Spanish Advanced Tutorial 3
(4 q.h.)
See LNS 4815.

MANAGEMENT

MGT 4101 Introduction to Business and Management 1 (3 q.h.)

Study of the setting and general structure of American business, including objectives and practices affecting the American standard of living. Examines the characteristics of private enterprise and the nature and challenge of capitalism and other forms of economic enterprise. Introduces types of businesses, the structures of organizations, and the functions of management as well as what a managerial career involves, what problems must be faced, and what decisions must be reached.

MGT 4102 Introduction to Business and Management 2 (3 q.h.)

Methodologies in planning, organizing, directing, and controlling production, marketing, sales, and pricing within the American free enterprise system and in contrast to other business systems. Examines techniques for coping with the intricacies of systems management. *Prereq.* MGT 4101.

MGT 4103 Introduction to Business and Management 3 (3 q.h.)

Basic management concepts and techniques necessary to successful decision-making. Emphasizes management as a continuous, active process by introducing methods of designing an organization; understanding and dealing with people; evaluating the political, social, and economic environment; and effectively planning, directing, and controlling an organization. *Prereq.* MGT 4102.

MGT 4105 Introduction to Business and Management (Intensive) (6 q.h.)

Same as MGT 4101 and MGT 4102.

MGT 4110 Survey of Business and Management (4 q.h.)

Introduction to the setting and general structure of American business, the characteristics of private enterprise, and the nature and challenge of capitalism and other forms of economic enterprise. Covers the forms of business, organizational structure, and func-

tions of management. Through lectures and class discussion, students are given an overview of the methodologies used in planning, organizing, directing, and controlling the functions of production marketing, sales, pricing, and finance. *For Alternative Freshman-Year students only.*

MGT 4317 The Business of Consulting (3 q.h.)

Covers the essential elements needed to establish a successful consultant enterprise. Examines the skills, aptitudes and experience required by the prospective consultant. Expands the strategies and methodologies used by consultants in conducting client assignments. Explores the differences in conducting client assignments in the public, private, industrial, service, and nonprofit sectors. *Not open to students who have completed CD 4117 and CD 4118 or CD 4119.*

MGT 4320 Managing Change (3 q.h.)

Application of managerial concepts and practices to real-world situations with policy or resource constraints. Explores decision making related to the impact of change on the organization and its personnel: develops a conceptual framework for handling change in one's own business career. *Prereq.* MGT 4102.

MGT 4323 Management and Leadership

(formerly Motivation Management) (3 q.h.)
Designed to help students differentiate between the managerial position as such and a leadership role, evaluating the impact of leadership and management styles on human behavior. Introduces and analyzes important motivation concepts through study of the working environment and the processes that influence both performance and outcome. *Prereq.* MGT 4102.

MGT 4328 Creating New Ventures (3 q.h.)

The nature of entrepreneurship and potential for self-employment by the individual. Includes the sequence from generation of an idea through the design of a plan for owning and operating a small business.

MGT 4329 Managing Small Businesses (3 q.h.)

Study of managerial operations of a small business. Presents issues and problems encountered by those considering entrepreneurial and small business endeavors, including the facets of financing, planning, market research, and strategy for small businesses.

MGT 4340 Small Business 1 (3 q.h.)

Development and completion of a full business plan for entrepreneurs or persons interested in operating a small business. Covers the nature and characteristics of entrepreneurship; personal analysis; generation of ideas and market identification; legal and tax ramifications of ownership forms; marketing research and planning.

MGT 4341 Small Business 2 (3 q.h.)

The marketing research and development of the marketing plan portion of the overall business plan. Topics include new business capital requirements, including the differences in venture and equity funding; and developing the financial management plan portion of the overall business plan, along with business strategy implications, personnel matters, and the use of computers. *Prereq.* MGT 4340.

MGT 4343 Small Business 1 and 2 Intensive (6 q.h.)

Same as MGT 4340 and MGT 4341.

MGT 4348 Introduction to the Global Marketplace (3 q.h.)

This course explores the characteristics of international trade and business, industrial/economic/political realities, organizational ownership and structure, and cultural dimensions. Students gain important perspectives on handling international personnel, operations, and marketing functions. Classes use real-world examples of management success and failure in international areas.

MGT 4354 The Manager's Role in Environment Issues (formerly Management and the Environment) (3 q.h.)

This course examines and discusses current rules and regulations addressing important and critical issues facing society as a whole—the environment in which we work and live. It considers the effect on managerial decision-making imposed by environmental issues facing organizations; considers how rules and regulations apply to different industries; discusses role(s) played by governmental agencies in implementing regulations; and, how these agencies and our legal system are used in enforcement. Prospective organizational accountability, responsibilities and possible managerial actions/activity which may be required for dealing with both present and future environmental issues will also be discussed.

MGT 4357 Cultural Issues in International Business (3 q.h.)

When a U.S. company opens an office in a foreign land, cultural clashes may occur. How does management cope and help its employees to cope with these differences? This course examines the problems of doing business in another country, including developing nations.

MGT 4358 Today's Management Issues (3 q.h.)

Study business and management issues affecting today's management decisions. Includes changes in our economic system and the economy; corporate culture; social responsibility; ethics; worker's needs, motivation, and satisfaction; demographics; and management-labor interactions. *Prereq.* MGT 4102.

MGT 4410 Project Management Process: Planning and Implementation (Reserved) (formerly Project Planning and Control) (3 q.h.)

The entire process of implementing a project, from project definition to the evaluation of feasibility, scheduling, and financial and budgetary factors. Management techniques and requirements are used in case analyses, along with the concept of using computer software to help oversee projects. *Prereq.* OM 4404 or OM 4301 and 80 q.h.

MGT 4446 International Business Management and Operations (Reserved) (formerly MGT 4456) (3 q.h.)

Principles and practices of international business, comparing domestic and international business activities, responsibilities, and influences. Explores the economic, social, political, and legal contexts of conducting business in a multinational environment and examines how the "foreign" factor in the business equation influences behavior. *Prereq.* MGT 4102.

MGT 4450 Business Policy 1 (Reserved) (3 q.h.)

For advanced students building on all previous management courses and on numerous functional and procedural courses. Examines the total management process for formulating business strategy. Covers the development of corporate objectives, plans, and policies, emphasizing the interaction between the enterprise and its environment, both na-

tional and international. The economic and social responsibilities of business and managers are also considered. *Prereq.* 130 q.h. and completion of all core business courses in your major or minor.

MGT 4451 Business Policy 2 (Reserved)
(3 q.h.)

Study of organizational and administrative methods for converting plans into achievements. Explores concepts of strategic planning and implementation from the perspective of the general manager, with attention to top management functions, responsibilities, styles, values, and organizational relationships. Includes cases from profit and non-profit enterprises of various types. *Prereq.* MGT 4450.

MGT 4452 Business Policy Intensive (Reserved) (6 q.h.)

Same as MGT 4450 and MGT 4451. *Prereq.* 130 q.h. and completion of all core business courses in your major or minor.

MGT 4455 Manager and Society (Reserved)
(3 q.h.)

For managers, potential managers, and others interested in the national and international issues confronting business and industry in their relationships with governments, societies, and individuals. Includes issues of changing work environments and the variety of influences and pressures that need to be taken into account when making socially responsible business decisions. *Prereq.* MGT 4102.

MGT 4600 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

MGT 4601 Honors Program 2 (4 q.h.)
See MGT 4600.

MGT 4602 Honors Program 3 (4 q.h.)
See MGT 4600.

MGT 4701 Independent Study 1 (3 q.h.)
Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

MGT 4702 Independent Study 2 (3 q.h.)
See MGT 4701.

MGT 4703 Independent Study 3 (3 q.h.)
See MGT 4701.

MGT 4800 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

MGT 4801 Advanced Tutorial 2 (3 q.h.)
See MGT 4800.

MANAGEMENT INFORMATION SYSTEMS

Please note: Computer labs for students' completion of projects are available at Main Boston, Batterymarch, Burlington, and Dedham. Students may also complete projects on any IBM or IBM-compatible computer available to them.

MIS 4102 Introduction to Data Processing and Information Systems 2 (3 q.h.)

Continuation of MIS 4101. Concentrates on software and systems. Includes the systems-development life cycle, programming tools and program preparation, the use of computers for specific business applications, database management systems, and high-level programming and planning languages. Class consists of in-class demonstration by instructor on Windows database and spreadsheet software. *Prereq.* MIS 4101. *Open only to students who have taken MIS 4101 or equiv.*

MIS 4104 Learning the Internet (0 q.h.)

Covers several different ways to gain access to the Internet. Includes e-mail, Telnet, FTP, Mosaic, the exciting World Wide Web and others. Hands-on-training is perfect for beginners and those who want to improve skills in data communications technology.

MIS 4105 Word for Windows-Basic (0 q.h.)

Learn how to prepare quality, professional documents using special features like Drag and Drop, Clipboard, AutoCorrect, AutoFormat and Style Gallery. Presents techniques to help improve speed, accuracy and productivity in word processing. Includes commands to format and edit documents and tools to proof text.

MIS 4106 Word for Windows-Advanced
(0 q.h.)

Topics include creating merge documents, inserting objects and graphics, creating tables and charts, formatting text in multiple columns, creating formulas and using formula

commands. Uses hands-on approach to make it easier to understand and apply techniques. *Prereq.* MIS 4105 or experience using Word for Windows.

MIS 4107 Access for Windows-Basic (0 q.h.)
Covers database objects like tables, queries, forms and reports. Includes creating tables, planning fields, setting properties. Material is presented in logical sequence to make it easy to understand. Workshop conducted in computer laboratory facility affording you the opportunity to practice as you learn.

MIS 4108 Access for Windows-Advanced (0 q.h.)
Presents tools for designing a relational database. Includes creating dynasets and subforms, using expressions, grouping data in a report, adding graphics to a report and customizing database objects. Workshop conducted in state-of-the-art computer laboratory. *Prereq.* MIS 4107 or experience using Access for Windows.

MIS 4109 Excel for Windows-Basic (0 q.h.)
Topics covered include creating worksheets, managing workbooks, using features like Autofill, Drag and Drop. Includes working in Dialog Boxes, entering labels and values, and entering formulas for calculations. Gives first-time users and those wanting to hone their skills a solid foundation on which to build as they develop the art of creating spreadsheets.

MIS 4110 Excel for Windows-Advanced (0 q.h.)
Covers techniques in creating and presenting charts. Includes topics like linking documents in workbooks, creating macros, and using pivot tables among others. Examines Goal Seek Command and What-if Scenarios, formatting templates and other key concepts and features. *Prereq.* MIS 4109 or experience using Excel for Windows.

MIS 4114 Introduction to PC Software (3 q.h.)
Introduction to PC based office automation and decision support software utilizing Microsoft Office. The focus of the class is on DOS, Microsoft Windows, Microsoft Word, and Microsoft Excel. Course consists of in class demonstration by instructor, and out of class hands-on assignments. *Not open to students who have taken MIS 4101, MIS 4102, or MIS 4103.*

MIS 4115 Introduction to Computers and Information Systems (3 q.h.)
Introduction to data processing concepts and computers, including an overview of data processing history, computer hardware, including configurations of personal computers, and larger computer systems, systems development life cycle, the use of computers for specific business applications, and data communications concepts. *Not open to students who have taken MIS 4101, MIS 4102, or MIS 4103.*

MIS 4116 Introduction to PC Software and Information Systems Intensive (6 q.h.)
Same as MIS 4114 and MIS 4115.

MIS 4210 Business Programming Logic (3 q.h.)
This course introduces the student to the discipline of creating logical solutions to business programming problems using flowcharts, hierarchy charts and pseudocode techniques. Emphasis is placed on the development of algorithms that could be coded into computer programs using a programming language such as COBOL, BASIC or "C". An overview of computer terminology is covered. *Prereq.* MIS 4102 or MIS 4114 and MIS 4115 or equiv.

MIS 4221 COBOL Programming 1 (3 q.h.)
Beginning computer problem-solving and programming using COBOL. Includes structured flow-charting and programming, basic concepts, COBOL divisions and verbs, multi-page reporting, report totals, and logical control breaks.

MIS 4222 COBOL Programming 2 (3 q.h.)
Continuation of MIS 4221. Includes table handling, (subscripting and indexing), internal sort concepts, (using, giving, input and output procedures), mass storage concepts (access methods, index file processing, random, and dynamic), and sequential and random file updating. *Prereq.* MIS 4221.

MIS 4231 COBOL Intensive A (6 q.h.)
Same as MIS 4221 and MIS 4222.

MIS 4235 Advanced COBOL Programming (3 q.h.)
Several advanced programming disciplines and techniques for the COBOL programmer. Includes string and unstring, cell subroutines, multi-dimension tables, advanced index file processing, debugging techniques,

and communications. Students work on major business projects, prepare and test several programs. *Prereq.* MIS 4222.

MIS 4236 Advanced PC Software (3 q.h.) Use of spreadsheets for charting, decision support and scenario planning. Development of database tables, table relationships, queries, reports and forms. Use of graphics for presentations. Class focus is on Microsoft Excel, Microsoft Access, and Microsoft Powerpoint. Includes lectures, in-class demonstrations, and extensive assignments that apply skills. *Not for the first-time personal computer user. Prereq.* MIS 4102 or MIS 4114 or *equiv.*

MIS 4238 Introduction to the Internet (3 q.h.)

Introduction to the tools and techniques necessary to effectively utilize the Internet. Topics covered include: electronic mail (EMAIL); remote site connection via Telnet; NEWSGROUPS and LISTSERVERS; location and retrieval of data with Gopher, Veronica, file transfer protocol (FTP), and Archie; and the World Wide Web (WWW) and its two most important browsers, MOSAIC and NETSCAPE. *Prereq.* Ability to use a MAC or a WINDOWS based personal computer.

MIS 4241 Programming in BASIC 1 (3 q.h.) Introduction to computer programming using BASIC. Includes arithmetic operations, variables, expressions, arrays, functions, and formatted printing. Students write, debug and run a number of programs on the computer. *Prereq.* MIS 4102 or MIS 4114 and MIS 4115.

MIS 4242 Programming in BASIC 2 (3 q.h.) Continuation of MIS 4241. Covers more sophisticated BASIC programming techniques. Includes subroutines, nested loops, sorting, and file handling. Students write, debug, and run a number of programs on the computer. *Prereq.* MIS 4241.

MIS 4243 Visual Basic Programming (3 q.h.) An introduction to developing Windows applications using the Visual Basic programming environment. The course covers the essentials of forms, objects and properties, controls and dialogs, and event-driven programming. Text and graphics processing, file-handling, and user interface design; the

basics of object-based programming, and the use of the grid and data controls. *Prereq.* Prior programming experience.

MIS 4244 Advanced Visual Basic (3 q.h.) Continuation of MIS 4243. Course covers advanced programming topics using the object oriented language, Visual Basic. Students learn how to create and run database, word processing and spreadsheet applications using Visual Basic. Students create graphics to interface with other software applications. *Prereq.* MIS 4243.

MIS 4273 PC DOS (3 q.h.)

Introduction to the Disk Operating System (DOS), a collection of programs that manages the activities among personal computer components. Students have the opportunity to write one or more DOS batch routines. *Prereq.* MIS 4102 or MIS 4114 and MIS 4115.

MIS 4276 C Programming 1 (3 q.h.)

Fundamentals of the C programming language, I/O operations, arithmetic operations, loops, arrays, character strings, functions. Structures, file organization (textfiles, random access files). Pointers, queues, stacks, rings, binary trees. *Prereq.* Prior programming experience.

MIS 4277 C Programming 2 (3 q.h.)

Advanced programming techniques using C, recursion, address arithmetic, the preprocessor, pointers vs. multidimensional arrays, pointers to functions, macros, nested structures, unions, file merging and sorting techniques, linked lists, command line arguments, binary trees, operations on bits, enumerated data types. *Prereq.* MIS 4276.

MIS 4278 C++ for C Programmers (3 q.h.)

OOP, ADT, objects, encapsulation, polymorphism, inline functions, member and friend functions, private, protected and public members of classes, constructors, destructors, operator overloading, impure vs. pure virtual functions, base classes, virtual base classes, derived classes, C++ I/O Library, inheritance, multiple inheritance, manipulators, various data structures including multikey trees. *Prereq.* MIS 4277. A C Programming proficiency test is given at the first class meeting.

MIS 4279 C Programming 1 and 2 Intensive (6 q.h.)

Same as MIS 4276 and MIS 4277.

MIS 4282 Operating Systems Overview

(3 q.h.)

Designed to introduce the student to the most frequently used operating systems—UNIX, PC-DOS, and MS WINDOWS. Through class lectures, reading assignments, and hands-on lab exercises, the student will examine the overall structure, genealogy, and basic commands of the three systems. *Prereq.* MIS 4102 or MIS 4114 and MIS 4115.

MIS 4283 Introduction to Windows Programming (3 q.h.)

Introduction to programming for the Microsoft Windows graphic environment using the C language. Covers Windows programming topics such as bitmaps, menus, icons, and dialog boxes, memory management, printing and Dynamic Link Libraries. Intended for those seeking a working knowledge of basic Windows programming techniques. *Prereq.* MIS 4276.

MIS 4301 Structured Systems Analysis and Design 1 (3 q.h.)

Systems analysis and design cycle, with emphasis on the analysis phase. Includes the history and life-cycle of business information systems, the role of the systems analyst, analytical tools useful to the systems study process, development of feasibility studies, and presentation of study phase findings. *Prereq.* MIS 4102 or MIS 4114 and MIS 4115 and prior programming experience.

MIS 4302 Structured Systems Analysis and Design 2 (3 q.h.)

Continuation of MIS 4301. Emphasizes the design phase and systems implementation. Includes detailed systems design procedures and techniques, system testing, specification and procedure writing, documentation, design of auditing and control procedures, performance measurement techniques, hardware and software selection and planning, and project management. *Prereq.* MIS 4301 or MIS 4401.

MIS 4305 Structured Systems Analysis and Design (Intensive) (6 q.h.)

Same as MIS 4301 and MIS 4302. *Prereq.* prior programming experience.

MIS 4307 Communications and Networking (3 q.h.)

Communications, networking, and distributed processing from the user's rather than the designer's point of view. Includes the economics of distributed processing, com-

munications concepts, local-area networks, and vendor selection. *Prereq.* MIS 4302 or MIS 4402.

MIS 4321 UNIX I (formerly UNIX for C Programmers) (3 q.h.)

Designed to provide an understanding of the Unix Operating System. Through reading assignments, lectures and lab exercises, the students will focus on the following topics: Files, text manipulation, editors, programming tools, comprehensive coverage of Unix utilities, e-mail and intermediate level shell programming. *Prereq.* MIS 4282 and MIS 4276.

MIS 4322 UNIX II (formerly UNIX Shell Programming) (3 q.h.)

Designed to provide a comprehensive study of shell programming, including C shell programming, a knowledge of the more advanced Unix utilities like sed and awk, and a survey of the Internet tools, like finger, rlogin/telnet, ftp, whois, netfind, gopher, archie, world wide web, WAIS, USENET news, online communications and anonymous e-mail. *Prereq.* MIS 4321.

MIS 4323 UNIX Intensive (6 q.h.)

Same as MIS 4321 and MIS 4322.

MIS 4342 Advanced Database (3 q.h.)

Focuses on designing a database for use in a relational database management system. Includes creating queries, linking files, cross indexing, designing forms and reports, and other advanced database techniques. Introduces the entity-relationship model. Requires implementing an application program. *Prereq.* MIS 4236.

MIS 4346 SQL: Introduction to Structured Query Language (3 q.h.)

Introduction to SQL, an application language for relational databases, such as Foxpro, dBase, and Access, is the natural follow-on to the database techniques learned in MIS 4236. SQL is the language that runs behind the windows the user typically sees when using a database package. SQL programs give the user an opportunity to create applications that provide greater flexibility and control over data manipulation requirements. The course will cover data table creation/access, indexing, arithmetic operations, loops, arrays, multiple table processing, I/P operations, data type conversions, printer control, and report generation. Includes lectures, in-

class exercises, and extensive assignments. *Prereq.* MIS 4236. MIS 4342 is recommended but not required.

MIS 4347 Desktop Publishing for the PC (3 q.h.)

Covers text and graphics for brochures and business packages. Includes desktop terminology, software and document creation. Also covers graphs and charts (bar, line, area, pie) and explores the draw/annotate feature. *Not open to students who have completed MIS 4344.*

MIS 4360 Computer Privacy and Security (3 q.h.)

Covers threats to companies and individuals when information technology is incorrectly protected or intentionally compromised. Includes actual case studies of computer information abuse, preventive controls, and ongoing information protection techniques. Data encryption, password controls, and information security awareness issues are discussed. *MIS 4102 or MIS 4114 and MIS 4115.*

MIS 4445 Database Management Systems (Reserved) (3 q.h.)

Introduction to the database approach to design of integrated information applications. Covers the three methods of database design; data structures; diagramming; data definition languages; data manipulation languages; database implementation and evaluation; and the role of the database administrator. *Prereq.* MIS 4222, MIS 4236, MIS 4302 or MIS 4402 or the equivalent and 80 q.h. or MIS 4402.

MIS 4446 Information Systems for Management (Reserved) (3 q.h.)

Students learn how information technology (IT) supports corporate goals. Emphasis is on the management of IT rather than on computer technology or programming. Readings and case studies will illustrate how IT may be employed to support general management functions. Issues such as the types of information systems, the impact of information systems on individuals and organizations, outsourcing, and the use of IT as a weapon of competitive strategy will be discussed along with technological issues such as database management systems, electronic data interchange, decision support systems, and expert systems. *Prereq.* MIS 4102 or MIS 4116. (*Not open to students who have taken MIS 4448.*)

MIS 4485 Applied MIS Development Project (Reserved) (3 q.h.)

Capstone systems course integrates knowledge and abilities gained through other computer-related courses in the curriculum, within a comprehensive systems development project. The student has a choice of two options. Option I is a systems analysis and system design of a small system which is usually personal computer-based. This includes the topics covered in MIS 4305 or MIS 4405 and requires the programming of two or three programs from the system designed. The final product is a complete system with operational programs. Option II is a detailed research project. The topic is selected by the student, approved and the scope defined by the instructor. The final product is a paper which covers the selected topic from various viewpoints. *Prereq.* MIS 4446.

MIS 4600 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

MIS 4601 Honors Program 2 (4 q.h.)

See MIS 4600.

MIS 4602 Honors Program 3 (4 q.h.)

See MIS 4600.

MIS 4701 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

MIS 4702 Independent Study 2 (3 q.h.)

See MIS 4701.

MIS 4703 Independent Study 3 (3 q.h.)

See MIS 4701.

MIS 4800 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

MIS 4801 Advanced Tutorial 2 (3 q.h.)

See MIS 4800.

MARKETING

MKT 4301 Introduction to Marketing 1 (3 q.h.)

This course consists of lectures, readings and small group discussions on the role of marketing in contemporary society, in the business enterprise, and in the nonprofit organi-

zation. Consideration is given to the planning, operation, and evaluation of marketing and promotional efforts necessary to the effective marketing of consumer and industrial products and services in both profit and nonprofit organizations.

MKT 4302 Introduction to Marketing 2
(3 q.h.)

Continuation of MKT 4301. Develops the link between marketing theory and practice. Covers specific marketing issues and problems. Includes current marketing issues. *Prereq.* MKT 4301.

MKT 4304 Introduction to Marketing (Intensive) (6 q.h.)

Same as MKT 4301 and MKT 4302.

MKT 4305 Internet Marketing (3 q.h.)

Course focuses on how to integrate Internet tools into a strategic marketing plan. Covers the differences between Internet marketing and other approaches. Includes topics on Internet demographics, email and discussion groups as information gathering and publicity tools, creating an electronic storefront, and designing a web page. Students are required to write a marketing plan that utilizes appropriate Internet tools as a final project. *Prereq.* MIS 4238 and MKT 4301.

MKT 4308 Direct Response Marketing
(3 q.h.)

Direct response marketing communicates directly with the prospective customer to create an immediate response. Topics include management of direct response programs in telemarketing, mail, catalog and print/broadcast media settings. Applications in consumer, business-to-business and non-profit areas are also discussed.

MKT 4310 Advertising Management 1
(3 q.h.)

This course focuses on the management of the advertising function in relation to a firm's overall marketing objectives. The course approaches the subject from the perspective of the user of advertising (e.g., product manager, marketing manager). Case studies and text material are used to help the student develop decision-making skills. *Prereq.* MKT 4301.

MKT 4315 Professional Selling Skills (formerly Sales Management 1) (3 q.h.)

Allows student to develop effective selling skills. Examines the customer buying pro-

cess and the company sales process. Discusses prospecting, preparation, presentation, and post-sale activities and introduces advanced selling techniques, such as team selling. Focuses on situations where personal selling is a major element of marketing strategy, such as industrial-product, professional-service, and high-technology marketing. *Prereq.* MKT 4301.

MKT 4320 Marketing Management (3 q.h.)

This course is designed to provide training in marketing decision-making. Case studies simulating actual business settings are used to help students develop analytical abilities and sharpen their communication skills. Topics covered ranged from techniques used to analyze a market to the development of a total marketing strategy (product policy, pricing policy, promotion policy, and distribution policy). *Prereq.* MKT 4301.

MKT 4411 Advertising Management 2 (Reserved) (3 q.h.)

Continuation of MKT 4310. Surveys why and how advertising works, and includes challenging and practical case studies. *Prereq.* MKT 4310 and 80 q.h.

MKT 4416 Strategic Sales Management (formerly Sales Management 2) (Reserved)
(3 q.h.)

Today the whole company sells because firms use a team approach to maintain customer relationships. So whether your field is marketing/sales, finance, operations, or information technology, the course material will be important in your career. The course develops the professional decision-making skills to build an effective marketing program. Topics include partnership selling, supervision of field operations, formulation of policies such as finding and developing salespeople, compensation and motivation, and the senior executive's responsibility for integrating overall marketing and sales strategy. *Prereq.* MKT 4315 and 80 q.h.

MKT 4430 Market Research 1 (Reserved)
(3 q.h.)

Course focuses on providing students with an introduction to the field of marketing research. Topics in Market Research 1 include problem definition, secondary and syndicated data sources, measurement concepts, questionnaire design, sampling, and experimentation. Emphasis on this course will be

on procedures and methods that should be used in order to increase the likelihood that high quality data will be obtained. *Prereq.* MKT 4301 and 80 q.h.

MKT 4431 Market Research 2 (Reserved)
(3 q.h.)

This course is a continuation of Market Research 1. It will familiarize students with commonly used data collection and data analysis methods. A majority of the course will be spent analyzing survey data using canned statistical programs (SPSS). Particular methods of analysis will include estimation procedures, chi-square analysis, correlation analysis, and analysis of variance. *Prereq.* MKT 4430 and 80 q.h.

MKT 4453 International Marketing (Reserved) (3 q.h.)

This course is designed to help familiarize the student with those aspects of marketing that are unique to international business within the framework of traditional functional areas of marketing. The focus is on the environment and the modifications of marketing concepts and practices necessitated by environmental differences. Topics include cultural dynamics in international markets, political and legal environmental constraints, educational and economic constraints, international marketing research, international marketing institutions, and marketing practices abroad. *Prereq.* MKT 4320 and 80 q.h.

MKT 4457 Competitive Strategy (Reserved)
(3 q.h.)

A capstone marketing course, required of all students with a marketing concentration. The focus is on the formulation of marketing strategy at a policy level and its implementation in a dynamic environment. *Prereq.* MKT 4320 and 80 q.h.

MEDICAL LABORATORY SCIENCE

MLS 1112 Renal Physiology and Urinalysis* (2 q.h.)

Introduces basic medical laboratory science. Examines principles and theories of renal physiology. Emphasizes techniques for chemical and microscopic detection of normal and abnormal urinary tract constituents. *The required laboratory is MLS 1212, Lab for Renal Physiology and Urinalysis. (1 q.h.) (Laboratory fee.) Prereq.* BIO 1107 and CHM 1111.

MLS 1125 Hematology* (4 q.h.)

Examines basic hematology procedures and principles. Emphasizes hematopoiesis, hematologic cell maturation, normal and abnormal cell morphology, basic hemostasis, and coagulation testing. *The required laboratory is MLS 1225, Lab for Hematology. (1 q.h.) (Laboratory fee.) Prereq.* BIO 1107, CHM 1122.

MLS 1132 Immunohematology* (3 q.h.)

Teaches the principles of immunohematology with specific application to the ABO and Rh blood group system, antibody detection, and crossmatch design. Studies basic blood bank techniques including blood typing and crossmatching. Replaces immunohematology lecture portion of MLS 1131. *The required laboratory is MLS 1232, Lab for Immunohematology. (1 q.h.) (Laboratory fee.) Prereq.* BIO 1107, MLS 1171, and MLS 1271.

MLS 1145 Microbiology* (4 q.h.)

Introduces the principles and techniques of organism isolation, cultivation, and identification from clinical specimens. Discusses identifying bacteria that are pathogenic for humans according to the isolated organism's clinical specimen. Emphasizes how to collect and transport specimens, what laboratory protocols to use in diagnosis, and procedures for identifying organisms. *The required laboratory is MLS 1245, Lab for Microbiology. (1 q.h.) (Laboratory fee.) Prereq.* BIO 1107, CHM 1122, and MLS 1172.

MLS 1152 Clinical Chemistry and Instrumentation* (4 q.h.)

Covers the principles of clinical chemistry with application to procedures and techniques. In laboratory work, emphasizes the clinical significance and common methods of quantitating selected important analyses. Replaces lecture portion of MLS 1151. *The required laboratory is MLS 1152 Lab for Clinical Chemistry and Instrumentation. (1 q.h.) (Laboratory fee.) Prereq.* CHM 1122, and MLS 1112 or MLS 1311.

*This is a day school course. Offered at a different tuition rate.

MLS 1172 Immunology* (2 q.h.)

Covers the basic concepts of medical immunology, including relationships among disease, immune response, and laboratory procedures. Encompasses the concepts of antigen and antibody structure and relationship, and specific and non-specific host response. Covers common laboratory methods for the detection of antigens and antibodies.

MLS 1412 MLT Special Topics—Applied Microscopy* (2 q.h.)

Offers clinical practicum in applied urinalysis, parasitology, and mycology at an affiliated hospital providing MLT (ASCP)- and CLT (NCA)-level instruction. *Prereq. Admission to MLT Clinical Program.*

MLS 1423 MLT Applied Study in Hematology* (2 q.h.)

Offers clinical practicum in hematology and coagulation at an affiliated hospital providing MLT (ASCP)- and CLT (NCA)-level instruction. *Prereq. Admission to MLT Clinical Program.*

MLS 1432 MLT Applied Study in Blood Banking* (2 q.h.)

Offers clinical practicum in blood banking at an affiliated hospital providing MLT (ASCP)- and CLT (NCA)-level instruction. *Prereq. Admission to MLT Clinical Program.*

MLS 1442 MLT Applied Study in Clinical Microbiology* (2 q.h.)

Offers clinical practicum in microbiology at an affiliated hospital providing MLT (ASCP)- and CLT (NCA)-level instruction. *Prereq. Admission to MLT Clinical Program.*

MLS 1452 MLT Applied Study in Clinical Chemistry* (2 q.h.)

Offers clinical practicum in clinical chemistry at an affiliated hospital providing MLT (ASCP)- and CLT (NCA)-level instruction. *Prereq. Admission to MLT Clinical Program.*

MLS 1480 MLT Seminar 1* (2 q.h.)

Offers a basic introduction to correlation of laboratory findings in hematology, blood banking, microbiology, and clinical chemistry, with appropriate referrals of lab information in working situation. Examines basic use of quality control. *Prereq. Admission to MLT Clinical Program.*

MLS 4104 Introduction to Phlebotomy (4 q.h.) (Offered Winter and Summer Quarters.)

This course emphasizes the role of the phlebotomist as part of the health care team. Topics will include proper patient identification, patient relationship, equipment, venipuncture procedure, anatomy and physiology, terminology and pertinent others. *Requires liability insurance coverage.*

MLS 4108 Phlebotomy Applied Study (2 q.h.) (Offered Fall and Spring Quarters.)

This course develops the confidence and experience needed to become an expert phlebotomist. Varieties of venipunctures will be performed under the supervision of clinical instructors in an affiliated clinical site. *Prereq. MLS 4104. (Laboratory fee.) Requires liability insurance coverage.*

MLS 4301 Medical Laboratory Science Orientation (2 q.h.) (Offered Fall Quarter.)

Scope, responsibilities, opportunities, and educational requirements for the medical laboratory science professions. Medical terminology and laboratory mathematics are included.

MLS 4321 Hematology† (3 q.h.)

Basic hematological techniques, including discussion of the differential smear and observation of the normal morphology of human red cells, white cells, and platelets. *(Laboratory fee.) Prereq. BIO 4109 or equiv. Not open to medical technology majors.*

MLS 4341 Epidemiology 1 (3 q.h.)

Basic concepts in epidemiology, the distribution in determinants of diseases and injuries in human populations. Descriptive and analytical epidemiology studies are included.

MLS 4342 Epidemiology 2 (3 q.h.)

Microbiological distributions in determinants of infectious diseases; hospital epidemiology. May be taken independently of Epidemiology 1.

MLS 4381 Seminar in Medical Technology (3 q.h.)

Current topics in medical technology. Includes required readings and presentations by students; guest lecturers. *Prereq. instructor's permission.*

*This is a day school course. Offered at a different tuition rate. All clinical courses require health clearance and liability insurance.

†Offered Fall 1997.

MLS 4700 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

MLS 4701 Advanced Tutorial 2 (3 q.h.)

See MLS 4700.

MANAGEMENT SCIENCE (see Operations Management)

MATH

MTH 4000 Overcoming Math Anxiety (Noncredit)

A four hour workshop that focuses on overcoming "math anxiety" by helping to demystify the world of mathematics. Examines mathematical myths and realities and the factors that interfere with learning. This hands-on workshop presents a comprehensive diverse approach to "math anxiety" that will help the students redirect their thinking in a way that will promote self-confidence and success in mathematics.

MTH 4001 Introduction to Mathematics 1 (formerly Introduction to Algebra 1) (3 q.h.)

Review of elementary algebra, including operations on integers, algebraic expressions, exponents, equations, word problems, and graphing. *Credit for this course cannot be applied to Lowell Institute, School of Engineering Technology degree programs.*

MTH 4002 Introduction to Mathematics 2 (formerly Introduction to Algebra 2) (3 q.h.)

Further review of mathematics, including operations with polynomials, factoring, fractional expressions, and radicals. *Credit for this course cannot be applied to the Lowell Institute degree programs. Prereq.* MTH 4001.

MTH 4006 Technical Mathematics* (4 q.h.)

Reviews high school algebra equations, formulas, exponents, polynomials, factoring, scientific notation, fractions, radicals, quadratic equations, and linear equations and their applications. Students are required to purchase a TI-85 graphing calculator or equiv. *Credit cannot be used in the associate in engineering, associate in science, or the bachelor of science in engineering technology degree programs.*

MTH 4107 College Algebra* (4 q.h.)

Examines laws of exponents, factoring, operations with fractional expressions, radical and complex numbers, Pythagorean theorem and distance formula, linear and quadratic equations and inequalities, and functional notation. Includes graphing of a wide variety of functions and equations including lines, conic sections, and polynomials. Studies solutions to many types of equations including linear, quadratic and polynomial. Also explores many applications of algebra. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4006 or equiv. in high school algebra.

MTH 4108 Pre-Calculus* (4 q.h.)

Studies exponential and logarithmic functions, trigonometric functions of angles in degrees and radians, trigonometric identities and equations, right triangles, law of sines and cosines, inverse trigonometric functions and polar coordinates. Examines complex numbers in trigonometric form, systems of linear and non-linear equations, binomial theorem, arithmetic and geometric sequences and series. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4107.

MTH 4110 Contemporary Algebra 1 (3 q.h.)

Real numbers, linear equations and inequalities, graphing and functions, and systems of linear equations. *Prereq.* one year of high school algebra or its equiv. A placement test is given during the first class meeting. Students who do not attain a qualifying score on this test are advised to enroll in MTH 4001, *Introduction to Mathematics*, for additional preparation. This course cannot be applied to the Lowell Institute degree programs.

MTH 4111 Contemporary Algebra 2 (3 q.h.)

Polynomials, rational expressions, exponents and radicals, quadratic equations and functions, conic sections, sequences and series. Exponents and radicals, linear equations in two variables, quadratic equations, functions and relations, conic sections, systems of equations and inequalities, sequences and series. *This course cannot be applied to the Lowell Institute degree programs. Prereq.* MTH 4110 or equiv.

*This is a Lowell Institute, School of Engineering Technology course, which is offered at a different tuition rate than that of University College.

MTH 4112 Contemporary Algebra 3 (3 q.h.)
Study of complex numbers; standard form of equation for circle, ellipse, and hyperbola; and exponential and logarithmic functions. Introduction to calculus including functions and their graphs, limits, average rate of change, derivative of a function and the rules of differentiation, maxima and minima, and optimization. *Prereq.* MTH 4111 or equiv. *This course cannot be applied to the Lowell Institute degree programs.*

MTH 4114 Contemporary Algebra 1 and 2 Combination (6 q.h.)
Same as MTH 4110 and MTH 4111.

MTH 4120 Calculus 1* (4 q.h.)
Studies general function operations, theory and evaluation of limits, derivatives of algebraic and trigonometric functions, general rules of differentiation, Rolle's theorem, and Mean Value theorem. Also covers application of differentiation including velocity; and acceleration, related rates, maximum, minimum, curve sketching, and approximations by differentials. Examines antiderivative as an introduction to integration. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4108.

MTH 4121 Calculus 2* (4 q.h.)
Examines the Riemann sum and the development of the fundamental theorem with applications to areas, volumes, and rectilinear motion problems. Topics include the logarithmic, exponential and inverse trigonometric functions and their applications; techniques of integration including parts, partial fractions, substitution, and the use of tables; numerical integration (Simpson's and Trapezoidal rules); L'Hopital's rule; improper integrals; geometry of vectors in a plane and space. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4120.

MTH 4122 Calculus 3* (4 q.h.)
Studies sequences and series to the development of Taylor and Maclaurin series, three-dimensional space, and a treatment of functions of several variables; multiple integrals with applications in areas and volumes; and differential equations, including the solution with applications of first-order with variables separable, first-order linear, and second-order linear homogeneous to complete

the sequence. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4121.

MTH 4123 Differential Equations* (4 q.h.)
Examines linear differential equations with constant coefficients, homogeneous and nonhomogeneous. Explores the variation of parameters and undetermined coefficients and simultaneous differential equations, the Laplace transform, series solution of differential equations, and the Fourier series. Studies orthogonal functions and numerical solutions of differential equations. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4122.*

MTH 4130 Fundamentals of Calculus 1 (3 q.h.)
Introductory course intended for students in liberal arts, business administration, and other nonengineering curricula. Includes fundamentals of differential calculus, rules of differentiation, rates of change, graph sketching, and growth and decay function. *This course cannot be applied to the Lowell Institute degree programs. Prereq.* MTH 4112 or equiv.

MTH 4131 Fundamentals of Calculus 2 (3 q.h.)
Applications of differential calculus, including problems in optimization, velocity and acceleration, compound interest, population growth, and the fitting of equations to data. Introduces integral calculus, areas, average values of functions, marginal cost and profit, and depreciation. *This course cannot be applied to the Lowell Institute degree programs. Prereq.* MTH 4130 or equiv.

MTH 4132 Fundamentals of Calculus 3 (3 q.h.)
Calculus of trigonometric functions, techniques of integration, numerical methods, and differential equations. Applications include pricing, allocation of funds, present value of an investment, manufacturing efficiency, and product reliability. *This course cannot be applied to the Lowell Institute degree programs. Prereq.* MTH 4131 or equiv.

*This is a Lowell Institute, School of Engineering Technology course, which is offered at a different tuition rate than that of University College.

MTH 4520 Statistically Thinking (3 q.h.)

Introduction to statistical mode of thinking. Presents the essential logic of statistical analysis to allow the student to critically evaluate research published in professional journals as well as newspapers. The process of collecting, analyzing, and interpreting data is discussed, as well as the use of computers in statistical analysis. Lectures used in conjunction with discussions of outside readings to illustrate concepts.

MTH 4700 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

MTH 4701 Advanced Tutorial 2 (3 q.h.)

See MTH 4700.

MUSIC

MUS 4100 Introduction to Music (3 q.h.)

The study of music as a major creative force and component of human civilizations in all parts of the globe. This survey course emphasizes the development of listening skills as well as an appreciation of musical forms within historical and cultural contexts.

MUS 4101 Music: A Listening Experience (3 q.h.)

Offers a computer-based "how to listen to classical music" course that assumes no previous musical knowledge. Studies masterworks of Western music but develops listening skills that are globally applicable. Students proceed at their own pace under the guidance and supervision of the instructor. All listening is done at a computer in the Media Center in room 200 Snell Library.

MUS 4110 Music in Popular Culture (3 q.h.)

Investigation of American attitudes toward culture, art, and beauty through consideration of contemporary popular music. Compares the different styles of pop music (jazz, rock, easy listening, and R&B) and traces their evolution. Examines the manipulation of public tastes by large corporations for commercial purposes.

MUS 4111 Rock Music (3 q.h.)

History of rock music from its origins in American blues and other styles through the popular music of the 1950s, the political styles of the 1960s, and the diverse trends of the 1970s. Emphasizes the formative years of rock.

MUS 4112 Jazz (3 q.h.)

Jazz, from its origins in New Orleans to the avant-garde experiments of today. Includes analysis of the rhythmic, harmonic, instrumental, and stylistic characteristics of jazz. Covers the works of such creative jazz artists as Armstrong, Beiderbecke, Parker, Ellington, and Coltrane.

MUS 4120 Music Appreciation: The Masterworks of Western Civilization (formerly History of Musical Styles) (3 q.h.)

Selected masterworks of the Euro-American traditions will be studied in a chronological survey. This course emphasizes the development of listening skills as well as an appreciation of musical forms within historical and cultural contexts. Composers to be studied include Bach, Handel, Mozart, Beethoven, Brahms, Wagner, Mahler, and Stravinsky.

MUS 4123 Music History of the Classical Period (3 q.h.)

Study of changing musical styles from Stamitz and the Mannheim School through the works of Haydn, Mozart, and early Beethoven.

MUS 4124 Music History of the Romantic Era (3 q.h.)

Musical styles of the nineteenth century, including the role of music and the musician in the changing social, economic, political, and cultural structure of Europe. Analyzes music by Beethoven, Schubert, Berlioz, Brahms, Verdi, and Wagner.

MUS 4125 Music History of the Twentieth Century (3 q.h.)

The diversity of styles from Debussy through Stravinsky, Schoenberg, Bartok, and Hindemith and more recent developments, including *musique concrete*, chance music, and electronic music.

MUS 4130 The Symphony (3 q.h.)

The symphony as the major genre in the Classical, Romantic, and contemporary periods. Covers works by Haydn, Mozart, Beethoven, Schumann, Tchaikovsky, Brahms, and Sibelius.

MUS 4140 Life and Works of Mozart (3 q.h.)

Mozart's musical development from child prodigy to mature artist, traced from his own letters and from biographies. Includes analysis of many of his major works, including operas, symphonies, concertos, and chamber music.

MUS 4141 Life and Works of J. S. Bach

(3 q.h.)

The genius who summed up the Baroque era and whose every note reflected his profoundly humanistic approach to religion. Works examined include large choral masterpieces, such as the *St. Matthew Passion*, the *Brandenburg Concertos*, the *Well-Tempered Clavier*, and the *Suites*.

MUS 4145 Life and Works of Beethoven

(3 q.h.)

The complex personality and art of this figure, including his relation to the turbulent times in which he lived and his role in Classical and Romantic music.

MUS 4160 Music Therapy (3 q.h.)

An introduction to the field of music therapy, including an exploration of the historical and current theories of music and medicine. Using skills developed in class, students will create and experience music activities for use in a variety of clinical settings. No music or therapeutic experience is necessary.

MUS 4163 Sound Health: Music and Relaxation 1 (3 q.h.)

Opportunity to experience a heightened awareness of the power of music to effect physical and emotional change, and to examine the effects of music on the body, mind, and spirit. An exploration into the awareness of sound and the physiological changes caused by music. Covers theories and techniques used to facilitate positive change, relaxation, and reduction of stress. Includes sound pollution, the effects of vibrations on the body, guided imagery, music and meditation, and New Age and environmental music.

MUS 4164 Sound Health: Music and Relaxation 2 (3 q.h.)

This course allows each student to strengthen his/her ability to work with specific techniques for using music to facilitate relaxation, stress reduction and inner healing for personal use or in a health care setting. Emphasis will be on creating healing imagery, choosing appropriate music and vocal techniques. *Prereq.* MUS 4163.

MUS 4165 The Music Industry (3 q.h.)

Business-related areas of the music industry. Addresses the structure of the record industry and music publishing world, the function of performing rights organizations (ASCAP

and BMI), and the role of concert and orchestral managers. Features guest lecturers from various fields and trips to "behind-the-scenes" locations.

MUS 4168 Building a Career in Musical Performance (3 q.h.)

Designed for performers representing themselves or for those interested in managing other artists. Topics include auditions, job investigation, resumes, photographs, press-kits, recording, and debut recitals. Students assemble press kits, write press releases and PSAs, and learn effective ways to garner and handle publicity, to differentiate among the various audio and video formats, and assay their ideas on novel methods of promoting themselves or others.

MUS 4171 Computers and Music (3 q.h.)

History of the use of computers for music composition, music and sound analysis, sound sampling and synthesis, and music scoring and printing. Emphasizes the latest technology, including the use of MIDI (Musical Instrument Digital Interface). Also features hands-on use of computers, music software, and synthesizers.

MUS 4172 The Recording Studio (3 q.h.)

The history and methods of audio reproduction from Edison's gramophone to today's multi-track digital techniques. Includes instruction and hands-on experience at the recording facility in the College's new Media Studio. Guest lectures from experts in the field and visit to a local professional studio. *(Additional fee required for studio work.)*

MUS 4180 Introduction to World Music (3 q.h.)

The varied musical cultures of non-Western societies. Exploration of characteristics common to all musical systems, followed by investigation of music in the Middle East, southern and eastern Asia, Africa, South and Central America, and the Caribbean.

MUS 4200 How to Read and Write Music (3 q.h.)

Basics of musical notation for students with little or no theory or performance background. Focuses on the use of the symbols of pitch and duration. Includes sight reading simple melodies, following scores, arranging music for small instrumental groups, transposition, and elementary rhythmic and melodic composition.

MUS 4201 Music Theory 1 (4 q.h.)

Basics of music theory as a foundation for further musical study and activity. Begins with aural and visual identification of pitches, intervals, major and minor scales, and triads in the G and F clefs. Includes rhythmic and simple melodic dictation, sight-reading, elementary melodic writing, and chord construction.

MUS 4231 Musical Performance 1 (1 q.h.)

Participation in rehearsals and public performances and/or research; and composition, arranging, conducting, and solo and ensemble activity with the NU Symphony Orchestra, the Early Music Players, the NU Chorus, the NU Bands, or other ensembles under the supervision of a faculty member. Evaluation of student progress at the end of the quarter by audition or other method. *Prereq.* audition or instructor's permission.

MUS 4232 Musical Performance 2 (1 q.h.)

Continuation of MUS 4231. *Prereq.* MUS 4231.

MUS 4233 Musical Performance 3 (1 q.h.)

Continuation of MUS 4232. *Prereq.* MUS 4232.

MUS 4234 Musical Performance 4 (1 q.h.)

Continuation of MUS 4233. *Prereq.* MUS 4233.

MUS 4235 Chamber Music 1 (3 q.h.)

Ten sessions, at least one-half hour each, for rehearsal, study, and performance of music for two to six players (matched according to level) under the guidance of a faculty coach. Repertoire selected from the full range of European concert music by the instructor in consultation with the students. For details, call 617-373-2416.

MUS 4236 Chamber Music 2 (3 q.h.)

Continuation of MUS 4235. *Prereq.* MUS 4235 or instructor's permission.

MUS 4237 Chamber Music 3 (3 q.h.)

Continuation of MUS 4236. *Prereq.* MUS 4236 or instructor's permission.

MUS 4241 Piano Class 1 (3 q.h.)

For beginning piano students who want to progress at their own pace. Grades are awarded after passing various step levels. Ownership of a piano is not required.

MUS 4242 Piano Class 2 (3 q.h.)

Introduction of scales, arpeggios, and triads to help students perform more advanced

music. Repertoire consists of original compositions by the instructor and simple works by Bartok and Kabalevsky. *Prereq.* MUS 4241 or equiv., or instructor's permission.

MUS 4243 Piano Class 3 (3 q.h.)

Two-octave scales, arpeggios, and triads in all keys. Repertoire consists of Bartok, Kabalevsky, original compositions by the instructor, and duets specifically arranged for this course. *Prereq.* MUS 4242 or equiv., or instructor's permission.

MUS 4244 Voice Class (3 q.h.)

Basic vocal production required for fine singing. Repertoire, both classical and contemporary, is chosen for each student to learn and perform in lessons and outside of class. Includes lectures concerning diction, the physiology of singing, resonance, registers, interpretation, and the basics of music reading and sight-singing. Also includes class analysis of recordings of great vocal artists.

MUS 4247 Guitar Class 1 (3 q.h.)

Intended for beginners. Covers basic classical guitar techniques, including proper sitting and hand positions, note reading, and ensemble playing. Instruments, preferably nylon-strung, are required.

MUS 4248 Guitar Class 2 (3 q.h.)

Intended for those who have taken MUS 4247 or who already have a basic knowledge of classical guitar techniques and note reading. Introduces both solo and ensemble repertoire suitable to the advanced beginner. *Prereq.* MUS 4247 or instructor's permission.

MUS 4249 Guitar Class 3 (3 q.h.)

Continuation of MUS 4248, with repertoire suitable for early intermediate students. *Prereq.* MUS 4248 or instructor's permission.

MUS 4261 Music Instruction (1 q.h.)

Individual instruction in a musical instrument or in voice. Lessons may be arranged on a 30-minute basis. Call 617-373-2416 for details. *Special fees.* May be repeated for credit.

MUS 4270 Synthesizer Class (3 q.h.)

Intended for beginners. Covers basic keyboard techniques and music-reading skills, as well as utilization of the special features of some of the more popular digital synthesizers.

MUS 4810 Honors Program 1 (4 q.h.)
Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

MUS 4811 Honors Program 2 (4 q.h.)
See MUS 4810.

MUS 4812 Honors Program 3 (4 q.h.)
See MUS 4810.

MUS 4815 Advanced Tutorial 1 (3 q.h.)
Opportunity to take an upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

MUS 4816 Advanced Tutorial 2 (3 q.h.)
See MUS 4815.

MUS 4820 Independent Study 1 (3 q.h.)
Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

MUS 4821 Independent Study 2 (3 q.h.)
See MUS 4820.

MUS 4822 Independent Study 3 (3 q.h.)
See MUS 4820.

NURSING

NUR 4402 Health Assessment (4 q.h.)
Provides the student with additional theory and skills relevant to the clinical decision-making role of the nurse as a primary care-taker. Extends the students' knowledge and experience of history-taking and physical and psychosocial assessment. Emphasizes analysis and synthesis of data obtained from a holistic health assessment as an essential framework for the identification of common health abnormalities and the enhancement of the nurse's clinical decision-making skills. *Open to any Registered Nurse.*

NUR 4403 Professional Transitions in Nursing (4 q.h.)
This course facilitates the advancement of the registered nurse student in the profession by expanding the theoretical basis of practice. Political, legal, and ethical issues form the basis for discussion of professional nursing. Self-evaluation and personal analysis of professional growth is enhanced through portfolio development and seminars. *Registration by petition to the Program Office.*

NUR 4502 Introduction to Nursing Research (4 q.h.)

Builds on students' prior exposure to selected studies applied to nursing. Discusses and critiques qualitative and quantitative research and the value of each to the practice of nursing and to the health-care field. Examines the importance of research in nursing to both practitioner and consumer. *Registration by petition to the Program Office. Prereq.* NUR 4403, ECN 4251, and ENG 4112.

NUR 4503 Nursing and the Community (7 q.h.)

This course uses the nursing process to promote healthy individuals, families, groups, and communities. The role of the nurse in multiple areas of practice is emphasized with special attention to health promotion and disease prevention strategies. Within the clinical practicum the student will have the opportunity to plan and provide nursing interventions to clients as they strive to improve their health status and the health of their community. The student will work independently and interdependently with clients, other health care providers, and community organizations. *Registration by petition to the Program Office. Prereq.* NUR 4402 and NUR 4403.

NUR 4508 Management and Leadership in Nursing (6 q.h.)

This course focuses on the knowledge and skills related to the delivery of nursing services within a management context. Theories, concepts and models are analyzed to provide the knowledge base for the management role. The clinical practicum enables the student to apply principles in a health-related organization. *Registration by petition to the Program Office. Prereq.* NUR 4503.

OPERATIONS MANAGEMENT

(formerly Industrial Management: IM)

(**Note:** PUR and MS courses now included under OM)

OM 4301 Introduction to Operations Management (formerly IM 4301) (3 q.h.)
Concepts and principles related to the management of operation functions, taught from

a management point of view. Relationships to other business functions. Operations, as a transformation process, with inputs of materials, investment, and people producing finished goods/services. Topics covered include product and process design, forecasting demand, capacity planning, facilities design, aggregate planning, scheduling, and quality control and assurance. *Prereq.* OM 4325. *Not open to students who have taken IM 4301 or IM 4401.*

OM 4314 Productivity Enhancement and Quality (formerly IM 4314) (3 q.h.)

The fields of quality control and productivity as a body of managerial, technological, behavioral, and economic knowledge, together with the organized application of this knowledge to the practical improvement of operations. Introduction to various productivity improvement programs currently in use, including measurement and control; the relationship between increase in productivity and managing for higher quality. Reviews management practices of modern quality control and the different approaches to optimizing quality. Includes the economics of total quality, internal and external quality, and management of long-term quality and reliability. *Not open to students who have taken IM 4314.*

OM 4321 Operations Planning and Control (formerly IM 4321) (3 q.h.)

The nature of control in general and the specific characteristics of management and operations control. Examines control structures, processes, and bases for design and implementation. *Prereq.* OM 4401, OM 4301 or OM 4404. *Not open to students who have taken IM 4321.*

OM 4325 Business Decision Models (formerly MS 4325) (3 q.h.)

Modeling as a method for gaining insight into the underlying mathematical structure of business problems. Discusses specific modeling techniques, such as linear programming and simulation. *Prereq.* MTH 4111 and ECN 4251.

OM 4332 Statistical Quality Control (formerly MS 4332) (3 q.h.)

Practical course designed to introduce the student to the basics of statistical process control (SPC) and acceptance sampling used

in quality control and quality assurance of products or services. Includes control charts for attributes and variables data, process capability analysis, statistical tolerancing, and acceptance sampling concepts and sampling plans for attributes. *Prereq.* ECN 4251.

OM 4351 Introduction to Purchasing (formerly PUR 4351) (3 q.h.)

Introduction to the function of purchasing in the industrial organization. Includes purchasing responsibilities, objectives, organization, and personnel requirements; purchasing policy and systems; the role of the computer in regulating purchasing, planning, transactions, and information retrieval; acquisition of purchased materials, development of sources of supply, and quality assurance; and determination and maintenance of required inventory levels. Also covers price determination, cost and price analysis, make or buy decisions, the role of standardization and value analysis. The process of purchase negotiations, ethical considerations in purchasing, purchasing law and contract cancellations are also examined. This course can be used for NAPM certification examinations.

OM 4357 Business Negotiations (formerly PUR 4357) (3 q.h.)

Explores buyer-seller communication and exchange. Includes the interactive process for arriving at a satisfactory agreement between buyer and prospective vendor and accepted strategies employed by both parties. Discusses economic and technical considerations and the psychological and interpersonal environments of negotiations.

OM 4358 Materials Requirements Planning (MRP) (formerly PUR 4358) (3 q.h.)

Includes the determination of material requirements based on the master production schedule; as well as calculation of the time periods in which materials must be available. The computer-based MRP system may be used as preparation for APICS certification exams.

OM 4370 Inventory Management (formerly PUR 4370) (3 q.h.)

Explores basic inventory management objectives, from the control of raw materials to finished goods and distribution inventory management. Includes aggregate inventory controls, lot sizing, customer service objectives, and the financial and physical controls

necessary for effective inventory management. Course may be used as preparation for APICS Certification examinations.

OM 4390 Just-In-Time Manufacturing (JIT) (formerly PUR 4390) (3 q.h.)

Just-In-Time manufacturing is a natural evolution of traditional practices which strives toward increasing through-puts, decreasing inventory investments, decreasing operating expenses, improving quality, etc. This course has been developed to introduce the student to the philosophies, principles, concepts, and techniques of Just-In-Time purchasing and manufacturing. Emphasis on the differences between traditional and J.I.T. manufacturing will be discussed in detail. This course will also help the student to prepare for the APICS Just-In-Time certification examination.

OM 4395 Master Production Scheduling (MPS) (formerly PUR 4395) (3 q.h.)

This course is divided into two sections: Forecasting and Master Production Scheduling. The Forecasting Section develops the concept of Forecasting; qualitative, intrinsic and extrinsic techniques, Forecast source data, Forecast accuracy, statistics, the relation of Forecasting to other processes and Management Considerations. The Master Production Scheduling Section develops the concepts of Master Scheduling Planning and Control, development and utilization of a Master Production Scheduler. Finally, the course discusses the link between Forecasting, the Master Production Schedule and Customer Orders. This course can be used for preparation for the APICS certification examination.

OM 4396 Systems and Technologies (formerly PUR 4396) (3 q.h.)

Systems and Technologies is the newest APICS module which focuses on the relationships between the functions of production and inventory control and manufacturing. The purpose of the course is to help the student understand the integrated needs of both existing and emerging technologies, and the synergy necessary to provide positive results in the production and inventory environment. This course helps the student recognize business, marketing, and manufacturing strategies that drive the choice and configuration of production and inventory functions, tools, and methods. This course can be used for preparation for the APICS certification examination.

OM 4404 Service Operations Management (3 q.h.) (Reserved)

Operational issues confronting organizations competing in the service sector are discussed. Topics covered include service design, location, and layout. Other topics addressed are the capacity decision, aggregate planning, technology, scheduling, inventory issues, and the pursuit of quality (excellence). *Prereq.* ECN 4251 and 80 q.h.

OM 4600 Honors Program 1 (formerly IM 4600) (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

OM 4601 Honors Program 2 (formerly IM 4601) (4 q.h.)

See OM 4600.

OM 4602 Honors Program 3 (formerly IM 4602) (4 q.h.)

See OM 4600.

OM 4701 Independent Study 1 (formerly IM 4701) (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

OM 4702 Independent Study 2 (formerly IM 4702) (3 q.h.)

See OM 4701.

OM 4703 Independent Study 3 (formerly IM 4703) (3 q.h.)

See OM 4701.

OM 4800 Advanced Tutorial 1 (formerly IM 4800) (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

OM 4801 Advanced Tutorial 2 (formerly IM 4801) (3 q.h.)

See OM 4800.

PHYSICAL EDUCATION

PED 4200 Cardiovascular Health and Exercise (3 q.h.)

Structured exercise program meeting three times per week and offering a choice of walking, jogging, swimming, or aerobic exercise classes and a weekly cardiovascular health lecture. Participants receive two comprehensive cardiovascular medical and physical fit-

ness evaluations, prior to and at the completion of the program. Includes a cardiopulmonary examination by a cardiologist, blood chemistry profile, pulmonary function testing, resting EKG, graded exercise treadmill (stress) test with EKG and blood pressure evaluation, along with an assessment of percent body fat (ideal weight and projected weight loss where applicable). Each participant receives a computerized report; individual exercise programs are based on test results.

PHILOSOPHY

PHL 4100 Philosophical Thinking (3 q.h.) Methods and values of thinking philosophically. Reveals strategies of dialogue and of informational discovery through understanding and use of the Socratic method of intellectual exchange. Analyzes the universal quest for truth in order to distinguish between knowing and not knowing, dogma, and ignorance. Proves value issues through questions in ethics and moral philosophy.

PHL 4102 Critical Thinking (3 q.h.) This course will provide the student with several key skills: the organization and development of argument, analysis of content, and clear and precise articulation of ideas. Standard critical thinking texts will be coupled with texts from a variety of sources, ranging from newspaper articles to materials originating in the student's own field.

PHL 4105 Philosophy of Knowing and Reality (3 q.h.) The difference between knowledge and belief. Areas of theoretical focus include the nature of ultimate reality, the nature of human knowledge, and the nature and existence of God. The investigation of a variety of problems and alternative solutions helps students think independently and self-critically. Emphasizes the development of discipline and precision in communicating ideas.

PHL 4110 Philosophy of Right and Justice (3 q.h.) Ethics and social and political philosophy. In ethics, addresses the questions "What sorts of things are good or bad?" and "What actions are right or wrong?" In social and political philosophy, examines theories of human nature, social change, social institutions, and major twentieth-century political theo-

ries. Possible additional topics include aesthetics and philosophy of history.

PHL 4165 Moral Problems in Medicine (3 q.h.) Social and moral problems created by medical science. Questions investigated include "Should a human life be prolonged under any condition and at any cost?" "What are the moral problems caused by the current medical definitions of death?" and "Is it morally right to predetermine the physical characteristics of future generations by genetic engineering?"

PHL 4170 The Human Search for Meaning (3 q.h.) Examination of selected philosophical problems of human existence, such as freedom, death, sexuality, alienation, and becoming a person.

PHL 4180 Business Ethics (3 q.h.) Ethical principles and considerations involved in making moral business decisions. Studies basic ethical viewpoints as a foundation; analyzes specific characteristics of business life through particular cases and examples.

PHL 4200 Logic (3 q.h.) Essentials of lucid thinking in terms of basic logical concepts, including deductive and inductive reasoning, valid and invalid arguments, and the varied functions of language and definition. Also examines how to recognize and evaluate different kinds of arguments, methods of detecting and avoiding common errors in reasoning, and the link between structured thought and effective communication.

PHL 4220 The Meaning of Death (3 q.h.) Various philosophical and religious views concerning the meaning of death. Discusses such questions as "What attitude should one take regarding one's own death?" "What role does death play in our personal relations to others?" and "Is it necessary to believe in an afterlife in order to give meaning to this life?"

PHL 4223 New Age Philosophy (formerly Philosophy of Consciousness) (3 q.h.) Theories of consciousness, the possibility of higher states of consciousness, and some techniques, such as meditation, alleged to lead to higher states of consciousness. Readings may include psychological and parapsychological literature on the subject.

PHL 4233 Special Topics in Philosophy (3 q.h.)

Examination of a variety of subjects and themes, such as ancient philosophy, philosophy of science and technology, and ethical issues in race and gender. Because topics change from quarter to quarter, students may take this course more than once, provided they focus on a different topic each time.

PHL 4235 Ethics and the Professions (formerly Personal Ethics) (3 q.h.)

As professionals, we face many decisions about the "rightness" or "wrongness" of our ideas and actions. Explores two different approaches to moral dilemmas: utilitarian theory, which defines the good as the best possible outcome, and deontological theory, which states that actions themselves are either good or evil. Applies these ethical theories to the moral choices we make as professionals in areas such as business, criminal justice, health care, and human services.

PHL 4243 Existentialism (3 q.h.)

Existential philosophy as understood through study of its greatest representatives, such as Kierkegaard, Nietzsche, Dostoyevsky, Heidegger, Jaspers, Camus, Sartre, and Merleau-Ponty. Focuses on the central themes of self-alienation, authenticity, and existential experiences.

PHL 4245 Philosophy of Religion (3 q.h.)

The arguments for the existence of God. Covers natural and moral evil, the soul, immortality, the evidence for miracles, and the nature of religious knowledge.

PHL 4247 Theistic, Atheistic, and Agnostic Philosophies (3 q.h.)

Selected theistic, atheistic, and agnostic philosophies. Questions studied include: "Is the belief in God necessary for a comprehensive philosophy of life?" "How does an atheistic philosophy explain and justify the 'higher values' such as love, beauty, and justice?" and "How is it possible to base a philosophy on the principle of agnosticism?"

PHL 4249 Woman's Spirituality (formerly Feminist Spirituality) (3 q.h.)

Women's religious experience as described in classical and contemporary sources. Readings include such works as *Womanspirit Rising*, *The Politics of Women's Spirituality*, and *Dreaming the Dark*.

PHL 4250 Philosophy of Human Nature (3 q.h.)

Philosophical and literary study of human nature. Questions include "What is human nature?" and "What is a human being?" Examines some of the philosophical answers to these questions, with special attention to the significance of tradition, social role, freedom, and decision.

PHL 4251 Images of Women in Philosophy (3 q.h.)

Philosophical approach to the study of women in society. Drawing from sources within the history of philosophy and literature, includes the role (ideal and actual) of women in society, love and marriage, oppression and isolation, and the cult of virginity.

PHL 4252 Women's Ethical Issues (3 q.h.)

The emerging feminist ethos as distinct from traditional descriptions of feminist morals and values. Discusses questions of politics, power, values, and actions. Readings include such works as De Beauvoir's *The Ethics of Ambiguity* and Daly's *Gyn-Ecology*.

PHL 4255 Women and Religion (3 q.h.)

The role and place of women in the major religions of the world and contemporary feminist challenges to these traditional understandings. Readings include such works as Carmody's *Women and Religion* and Daly's *Beyond God the Father*.

PHL 4256 Introduction to Feminist Thought (3 q.h.)

Introduction to feminist scholarship in various fields. Explores what constitutes knowledge when women's experiences, rather than men's, frame the questions, provide the data, and interpret that data.

PHL 4265 Contemporary Religious Issues in America (formerly Understanding Religion in America Today) (3 q.h.)

Study America's remarkable religious pluralism. Includes contemporary Christianity and Judaism, nontraditional Christian and non-Christian movements, cults, sects, and quasi-religious organizations. After becoming familiar with American religious foundations, students study the connections between religion and sociotechnological change, sex, biomedical ethics, politics, and the media. May include guest speakers.

PHL 4266 The Religious Right in Contemporary America (3 q.h.)

Evangelism, fundamentalism, extremist groups, and nontraditional Jewish and Christian movements. Also examines "priesthood of all believers," grace and the idea of the "elect," and the state of being "born again" as well as the New Deal, the Great Society, and the "conservative revolution." Includes background on the roots of these movements, from precolonial Europe and Puritan America to the development of the Social Gospel. May include guest speakers.

PHL 4267 Cults and Sects (3 q.h.)

Examines the varieties of religious experience from the perspectives of sociology and psychology of religion. Focuses on such cultic and sectarian groups as Christian Science, the American Shakers, the Unification Church, the Hare Krishna movement, and the Black Muslims. Provides the student the opportunity to acquire critical investigative tools with which to analyze different religious expressions.

PHL 4270 The Great Western Religions (3 q.h.)

Study of the basic teachings of Judaism, Christianity, and Islam.

PHL 4273 Judaism (3 q.h.)

Philosophy of the Jewish religion, its metaphysical and ethical beliefs, and the philosophical origins of these beliefs.

PHL 4275 The Great Eastern Religions (3 q.h.)

Study of the basic teachings of Taoism, Confucianism, Buddhism, Hinduism, and Shintoism.

PHL 4277 Hinduism (3 q.h.)

The Hinduism of the *Upanishads*, the most explicit of the mystical religions. Also includes the devotional aspect of Hinduism as expressed in the *Bhagavad Gita*.

PHL 4279 Buddhism (3 q.h.)

Central teachings of Buddhism, including the doctrines that there is no independently existing immutable self or soul, that all phenomena are impermanent, that existence is suffering, that suffering has a cause, and that there is a way to eliminate suffering.

PHL 4280 Islam (3 q.h.)

History of Islam, its conflicts with the West in the past and in the present, Islamic beliefs, and the future of Islam as a world religion.

PHL 4293 Mysticism: East and West (3 q.h.) Inquiry into mystical experience through a comparative study of the writings of Christian, Buddhist, and Hindu mystics and of secondary interpretive sources. Explores the potential oneness of humanity with God, the conflict of mysticism with traditional forms of religion, and the possibility of a common, cross-cultural basis for mysticism.

PHL 4317 Understanding the Bible (3 q.h.)

This course introduces students to the Old and New Testaments so that they may enter into a dialogue with the Bible, understanding not only what it says, but why it is said that way. Discussion focuses on the bible's social, political, and cultural backgrounds.

PHL 4330 Myths, Dreams, and Mysteries (formerly The Encounter of Psychology and Religion) (3 q.h.)

Exploration of the ways the sense of self shapes and is shaped by religion. Emphasis on dominant Western psychologies and religions. Examination of the role of religious values in defining cultural values, and of these values in determining a sense of self.

PHYSICS

PHY 4101 College Physics 1* (4 q.h.)

Fall, Summer Quarters.

Introduces students to mechanics, including units of measurement, vectors, accelerated motion, and Newton's laws of motion. Topics include conservation of energy, work, momentum, elements of heat, mechanical waves, and vibrating bodies. Includes laboratory experiments and classroom demonstrations as integral parts of this course. (This course is intended for health professions and science programs and cannot be used for credit towards technology degrees in the Lowell Institute, School of Engineering Technology.) *Prereq.* MTH 4107 or equiv.

**This is a Lowell Institute, School of Engineering Technology course, which is offered at a different tuition rate than that of University College.*

PHY 4102 College Physics 2* (4 q.h.)

Winter, Summer Quarter.

Introduces magnetism, magnetic fields, electromagnetic induction, electrostatics and electric circuits. Discusses appropriate topics in optics, nuclear and atomic physics. Involves frequent laboratory experiments and classroom demonstrations. (This course is intended for the health professions and science programs and cannot be used for credit towards technology degrees in the Lowell Institute.) *Prereq.* PHY 4101.

PHY 4117 Physics 1* (4 q.h.)

All Quarters.

Introduces vectors and balanced forces, accelerated motion, projectile motion, Newton's laws, work and energy, momentum. *Prereq.* MTH 4107 or concurrently.

PHY 4118 Physics 2* (4 q.h.)

All Quarters.

Explores rotational motion, rotational dynamics, elasticity, periodic motion, electric forces and fields, electric potential, capacitance, electromotive force, and direct current circuits. *Prereq.* PHY 4117.

PHY 4119 Physics 3* (4 q.h.)

All Quarters.

Covers magnetic fields and forces, electromagnetic induction, inductance, Gauss's law, electromagnetic waves, mechanical waves, sound, and the interference and diffraction of light. *Prereq.* PHY 4118.

PHY 4196 Physics Laboratory 1* (1 q.h.)

All Quarters.

Includes experiments in acceleration, force, circular motion, energy, and momentum that follow lecture topics in PHY 4117. *Prereq.* PHY 4117 concurrently.

PHY 4197 Physics Laboratory 2* (1 q.h.)

All Quarters.

Includes experiments in statics, rotation, simple harmonic motion that follow the lecture topics in PHY 4118. *Prereq.* PHY 4196 and PHY 4118 concurrently.

PHY 4198 Physics Laboratory 3* (1 q.h.)

All Quarters.

Includes experiments in circuits, optics, electromagnet and waves that follow the lecture topics in PHY 4118 and PHY 4119. *Prereq.* PHY 4197, PHY 4118 and PHY 4119 concurrently.

POLITICAL SCIENCE**POL 4103 Introduction to Politics** (3 q.h.)

Introduction to contemporary political science, including consideration of basic concepts in political analysis, the role of government institutions, political representation, political ideologies, and the scope and methods of political science.

POL 4104 Introduction to American Government (3 q.h.)

American governmental and political processes, constitutional institutions, political behavior, and liberties.

POL 4105 Introduction to Comparative Politics (3 q.h.)

Comparative study of constitutional and totalitarian systems, including the Western European and Soviet patterns.

POL 4106 Introduction to Politics (4 q.h.)

Basic political concepts and forces of organization from the classical Greeks to the modern nation-state. The Soviet Union and the United Kingdom are contrasted as contemporary illustrations of the institutional distinction between a totalitarian and a constitutional system. *For Alternative Freshman-Year students only.*

POL 4110 The Great Political Thinkers (3 q.h.)

Explores the great political thinkers from ancient Greece to the twentieth century. Probes the creative genius of such theorists as Plato, Aristotle, Aquinas, Hobbes, Hegel, Locke, Rousseau, Mill, and Marx.

POL 4112 Political Elites in Modern Democracies (formerly Political Elites in Advanced Industrial Societies) (3 q.h.)

This course focuses on theories of political elites in advanced industrial societies. The question of who rules is central. What role do elites play in modern democracies? Are there in fact elites? The theories of Mosca, Pareto, Michels, and the modern debate represented by thinkers such as Mills and Dahl are central to this course. The course also presents the Marxist, pluralist, and corporatist paradigms for understanding politics with respect to the issue of elites.

*This is a Lowell Institute, School of Engineering Technology course, which is offered at a different tuition rate than that of University College.

POL 4300 Introduction to Public Administration (formerly Public Administration 1) (3 q.h.)

Introduction to the theory, forms, and processes of administration at the national and state levels.

POL 4301 Case Studies in Public Administration (formerly Public Administration 2) (3 q.h.)

Case-study examination of the relationship between the theory and practice of public administration. *Prereq.* POL 4300 or *equiv.*

POL 4302 Public Administration (Intensive) (6 q.h.)

Same as POL 4300 and POL 4301.

POL 4303 Public Personnel Administration (3 q.h.)

Study basic elements of personnel administration, including recruitment, training, classification, promotion, and executive development. Pays special attention to current problems, such as equal opportunity, public employee unionism, and collective bargaining.

POL 4304 Public Budgeting (3 q.h.)

Politics, procedures, and goals of government budgeting at the federal, state, and local levels are covered. Includes expense, capital, and program budgeting.

POL 4305 Organizational Theory (3 q.h.)

Examines people and organizations, focusing on organizational and societal problems as a way of understanding how we can survive in a bureaucratic system.

POL 4306 Public Policy Analysis (3 q.h.)

Procedures for the analysis of public policy are studied, including discussion of selected cases of public policy at the local, state, or federal level.

POL 4307 Politics of Health in International Development (formerly The Politics of Health) (3 q.h.)

Explores the problems of health in developing countries, particularly during the last decade. Examines the political dynamics at the village, national, and global levels that have hindered efforts to establish health care delivery systems. Analyzes issues of nationalism and problems of refugees.

POL 4309 Business and Government (3 q.h.)

Explores the interaction between business and government, and the constraints within which each must operate in our society. Issues to be raised include the structure and function of the corporation, understood as a political entity; the "revolving door" between business and government; the impact of corporations on democratic processes and institutions; and the degree to which political rights and economic rights are intertwined.

POL 4310 American Political Thought (3 q.h.)

Topics include political thought from the Colonial period to the present, including study of the impact of religious, economic, and judicial theories on the structure of American ideas.

POL 4311 Research Methods (3 q.h.)

Introduction to some of the most common methods of conducting political science research. Includes problems of theory construction and data-gathering and such analytical research tools as bibliographical aids and the computer.

POL 4312 Political Parties and Pressure Groups (3 q.h.)

Discusses party government in the United States focusing on the interaction of party and government.

POL 4313 State and Local Government (formerly Government and Politics and the States) (3 q.h.)

State and local governments, their problems, and functional and operational responses to these problems are examined.

POL 4314 Urban and Metropolitan Government (3 q.h.)

Explores political, structural, and functional problems of an urbanizing United States. Includes an analysis of urban, suburban, and metropolitan governments.

POL 4316 Ecology in Political Perspective (3 q.h.)

Human beings have become major actors for ecological change. Not only are we a part of nature, we use and reshape nature. This course is structured to explore the impact of human beings on nature, and to prognosticate what will happen if present trends con-

tinue. A core interest in the course will be to examine the efforts of interested citizens and organizations to use political means to control and direct these trends.

POL 4318 The American Presidency (3 q.h.)
Study of the nation's chief executive. Includes topics such as the presidential electoral process, the president's many constituencies, and the differing styles of twentieth-century presidents. Also covers constitutional and extraconstitutional powers of the office.

POL 4319 The Congress (3 q.h.)
Institutional and functional analysis of the roles of Congress are examined, as well as the chief executive, and political parties in the legislative process.

POL 4320 American Constitutional Law (3 q.h.)
A case analysis of the development of Federalism, the separation of powers, and the role of the federal and state courts in constitutional development.

POL 4321 Civil Liberties (formerly Civil Rights) (3 q.h.)
Examination of quality and content of civil liberties in the United States. Emphasizes the First, Fifth, Sixth, Fourteenth, and Fifteenth amendments to the Constitution.

POL 4322 Criminal and Civil Due Process (formerly Procedural Due Process) (3 q.h.)
Study of due process in the American constitutional scheme.

POL 4324 Politics and Documentary Film (3 q.h.)
Designed to complement *POL 4325, Politics and Film*, this course will focus on the documentary in an attempt to analyze the political themes and ideas different film-makers bring to their subject. Implications for contemporary American society will be highlighted. Films to be viewed include Chris Marker's *Sans Soleil*, Peter Davis' *Hearts and Minds*, Frederick Wiseman's *Missile*, Michael Moore's *Roger and Me*, and Barbara Koppel's *The American Dream*.

POL 4325 Politics and Film (formerly The Politics of Films) (3 q.h.)
The relationship between films and politics is explored. Films are analyzed for their political content and impact on specific controversies and on politics and society as a whole.

POL 4326 The Sixties (3 q.h.)
A political, philosophical, sociological and cultural analysis of the Sixties is presented. The major issues of that era are discussed: civil rights, the Vietnam War, the student movement. Special attention is given to the arts, including music and film.

POL 4327 Women in American Politics (formerly Sex Roles in American Politics) (3 q.h.)
Topics such as the roles of women in American government and politics, including the traditional roles—or absence thereof—of women in American politics, the suffrage movement, the impact of sex on achieving political power and office, the growing importance of the women's vote, the women's movement, and political action to support women's issues are covered.

POL 4328 Mass Media and American Politics (3 q.h.)
The study of the role of the media in shaping political opinions and behaviors. The role of the media in setting political agendas and reporting and interpreting political events will be examined. The nature and influence of public opinion in a democratic society will also be studied.

POL 4329 Psychology of Politics (3 q.h.)
How do psychological processes affect politics? How are people's political beliefs and attitudes shaped? What needs, intrinsic or otherwise, do people bring into the political process? What is "human nature," and what impact does it have on society? Is a non-repressive society possible? These are some of the issues to be discussed in this course, which will attempt to integrate politics and psychology into a comprehensive analytical framework.

POL 4330 Comparative Politics (3 q.h.)
Discusses political culture, organization, and behavior in different national settings.

POL 4331 International Relations (3 q.h.)
Studies elements of and limitations on national power. Discusses contemporary world politics, problems of war, and peaceful coexistence.

POL 4332 International Organization (3 q.h.)
The development of international organizations, emphasizing the United Nations, specialized agencies, and regional organizations, is explored.

POL 4333 International Law (3 q.h.)

Examines the procedural and substantive study of the legal relations among nation-states.

POL 4334 International Political Economy (3 q.h.)

Covers the nature and development of post-war international economic order, trade, and monetary regimes, the world bank, oil, debt and sovereign lending practices, rise of Europe and Japan, international regime analysis, recent trade agreements, post-Cold War issues, and liberal, radical, and realist approaches to international political economy.

POL 4336 American Foreign Policy (3 q.h.)

Study of recent and current American foreign affairs.

POL 4337 The Politics of Arms Control (3 q.h.)

Discusses the nuclear arms rivalry between the United States and the Soviet Union, along with opportunities for curtailing it through arms control. Includes the nature and purposes of nuclear weapons, past arms-control agreements, and recent breakthroughs. Explores current options for arms control.

POL 4338 European Political Parties (3 q.h.)

Emphasizes political party systems in England, France, and Germany, and their ideology, organization in and out of Parliament, electoral strategies, and voter behavior.

POL 4339 Government and Politics of Russia (3 q.h.)

Surveys the government and politics of the Soviet Union as it was and of Russia today. Covers the history of the Soviet regime, government, economy, party, ideology, political culture, Gorbachev and his reforms, the breakup into various republics, and the problems facing Russia today.

POL 4341 Russian Foreign Policy (3 q.h.)
Surveys Russian and Soviet foreign policy from 1917 to the present with special focus on the postwar period and the foreign policy reforms and problems faced by the new regime. Emphasis is given to Russia's relations with the West including Western economies.

POL 4342 Eastern Europe in Transition (formerly Communism in Eastern Europe) (3 q.h.)

Surveys the new states of Eastern Europe with a focus on economic and political re-

forms. Topics include the governments and institutions of the new regimes, the problems in instituting the market into their economies, and efforts to establish links with Western Europe and international economic organizations such as the IMF. Surveys the old regimes as single-party dictatorships, the tensions that existed with their Soviet connections, and the forces that led to their braking away from Moscow.

POL 4350 Politics and Policies of the Developing Nations (3 q.h.)

Covers colonialism, the struggles for independence, and the common problems of developing nations. Includes economic development, urbanization, cultural fragmentation, and revolution.

POL 4352 Government and Politics of Latin America (3 q.h.)

Explores the historical background of the Latin American nations and their cultural, economic, social, and political characteristics, including political violence and the breakdown of democratic governments.

POL 4356 Government and Politics of Northern Africa (3 q.h.)

A comparative analysis of political culture, organization, and behavior of African states north of the Sahara, with emphasis on Morocco, Algeria, Tunisia, and Egypt.

POL 4357 Government and Politics of South Africa (3 q.h.)

An analysis of political culture, organization, and behavior of South Africa. Examines the South African history to show how South Africa got where it is today, including the nature, implications, and problems of both the apartheid and post-apartheid periods and prospects for the future.

POL 4359 Government and Politics in the Middle East (3 q.h.)

Political change, economic growth, and social adaptation in selected countries is discussed. The emergence of the Middle East from subjection to self-assertion is examined, focusing on such topics as the influence of Western Modernism, Muslim fundamentalism, inter-Arab rivalries, Arab-Israeli conflict, and the civil strife in Lebanon.

POL 4362 Government and Politics of Southeast Asia (3 q.h.)

Explores political instability and problems of establishing democratic structures and processes in the Philippines, Thailand, and India.

POL 4364 China's Foreign Policy (3 q.h.)
Examines Beijing's relations with Africa, the rest of Asia, the Soviet orbit, and the West. Covers policy objectives, strategy, tactics, and the methods of decision-making in both the party and state apparatus.

POL 4365 Government and Politics of China (3 q.h.)

Discusses Chinese political culture, emphasizing the nineteenth-century cultural, economic, and political impact of the West, the emergence of the Communist party under the leadership of Mao Tse-Tung, and the progressive disintegration of Kuomintang leadership.

POL 4367 Government and Politics of Japan (3 q.h.)

Examines the historical development of the Japanese nation, with particular attention to the growth of fascism and efforts to create a viable democracy since World War II.

POL 4370 Introduction to Political Theory (3 q.h.)

Discusses the development of the political ideas of the Western world, including the ideas of the major philosophers of Greece, Rome, the Christian Era, and the Renaissance.

POL 4371 Modern Political Theory (3 q.h.)

Explores political ideas and systems of thought from Machiavelli to the present. *Prereq.* POL 4370 or *equiv.*

POL 4372 Contemporary Political Thought (3 q.h.)

Analyzes current ideas, ideologies, and political movements. Examination of such topics as neo-conservatism, neoliberalism, neo-Marxism, and women's liberation.

POL 4373 Islamic Political Thought (3 q.h.)

Introduces Islamic thought and political theory. Analyzes such classical theorists as Avicenna, Averroes, Al-Ghazali, and Ibn Khaldun, and such modern theorists as Abduh, Iqbal, and Shari'ath.

POL 4378 Current Political Issues (3 q.h.)

Explores the constitutional and political basis of selected problems in American political life.

POL 4815 Advanced Tutorial 1 (3 q.h.)

Opportunity to take an upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

POL 4816 Advanced Tutorial 2 (3 q.h.)

See POL 4815.

POL 4820 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

POL 4821 Independent Study 2 (3 q.h.)

See POL 4820.

POL 4822 Independent Study 3 (3 q.h.)

See POL 4820.

POL 4830 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

POL 4831 Honors Program 2 (4 q.h.)

See POL 4830.

POL 4832 Honors Program 3 (4 q.h.)

See POL 4830.

PSYCHOLOGY

PSY 4110 Introduction to Psychology:

Fundamental Issues (formerly Fundamental Issues in Psychology) (3 q.h.)

Explores fundamental principles and issues of contemporary scientific psychology, which are approached as a method of inquiry as well as a body of knowledge. Examines the origins and methods of psychology, biological foundations of behavior, states of consciousness, learning, and memory.

PSY 4111 Introduction to Psychology:

Developmental Aspects (formerly Developmental Aspects in Psychology) (3 q.h.)

Covers growth and the life-cycle, language, mental abilities, sensory and perceptual processes, and social interaction. *Prereq.* PSY 4110 or *equiv.*

PSY 4112 Introduction to Psychology:

Personal Dynamics (formerly Personal Dynamics in Psychology) (3 q.h.)

Examines motivation, emotion, personality theory and measurement, abnormal psychology, and therapy. *Prereq.* PSY 4110 or *equiv.*

PSY 4114 Introduction to Psychology

Intensive (6 q.h.)

Same as PSY 4110 and PSY 4111.

PSY 4220 Statistics in Psychology 1 (3 q.h.) Scales of measurement in psychological research, measures of central tendency, and variability are discussed. *Prereq.* PSY 4111 and PSY 4112 or *equiv.*

PSY 4221 Statistics in Psychology 2 (3 q.h.) Introduces measures of correlation, probability, and statistical distributions. *Prereq.* PSY 4220 or *equiv.*

PSY 4222 Statistics in Psychology 3 (3 q.h.) Explores parametric and nonparametric tests of significance, including chi square, t-test, F test, and simple analysis of variance. *Prereq.* PSY 4221.

PSY 4231 Psychology of Learning (3 q.h.) Studies the basic principles and techniques of operant and Pavlovian conditioning and their applications to therapeutic, educational, and specialized training programs. *Prereq.* PSY 4111 or PSY 4112 or *equiv.*

PSY 4232 Motivation (3 q.h.) Topics include various aspects of motivation, including primary and secondary reinforcement, unconscious motivation, effectuate motivation, and the assessment of motives. *Prereq.* PSY 4112 or *equiv.*

PSY 4240 Development: Infancy and Childhood (formerly Developmental Psychology: Infancy and Childhood) (3 q.h.) Explores human development from infancy through late childhood. Covers physical, cognitive, and psychosocial development, including the development of language, morality, and interpersonal relationships.

PSY 4241 Development: Adolescence (formerly Developmental Psychology: Adolescence) (3 q.h.) Examines development during the second decade of life, emphasizing the tasks and problems confronting the individual adolescent. Includes topics such as biological, social, and cognitive changes as they relate to the creation of a stable, individual identity.

PSY 4242 Development: Adulthood and Aging (formerly Developmental Psychology: Adulthood and Old Age) (3 q.h.) Discusses the unique features and problems of development from the adult years to death. Emphasizes changes that accompany career, marriage, and family developments and the specific psychological adjustments required of the aging person.

PSY 4262 Memory and Thinking (formerly Cognitive Psychology) (3 q.h.) Explores the mental processes involved in the acquisition, organization, and use of knowledge, including pattern recognition and memory. *Prereq.* PSY 4111, PSY 4112, or *equiv.*

PSY 4270 Social Psychology 1 (3 q.h.) Studies the socialization process, social motives, interpersonal perception, and group membership and structure. *Prereq.* PSY 4111 or *equiv.*

PSY 4271 Social Psychology 2 (3 q.h.) Examines topics of attitudes, prejudice and ethnic relations, leadership, mass behavior and social movements, and the effects of mass media on communication. *Prereq.* PSY 4270 or *equiv.*

PSY 4272 Personality (3 q.h.) Studies the normal personality and its growth and development. Includes concepts such as environmental and genetic contributions, assessment of personality, research, and a survey of the major personality theories. *Prereq.* PSY 4112 or *equiv.*

PSY 4276 Stress and Its Management (3 q.h.) Covers stress and its effects on human behavior. Considers the causes of stress from a variety of theoretical perspectives. Techniques and procedures for stress management and reduction examined in detail.

PSY 4280 Human Sexuality and Love (3 q.h.) An examination, both theoretical and experimental, of psychological, biological, and social aspects of sexuality and loving. Topics include sexual anatomy and physiology; birth control; gender identity and gender role; romantic love (with emphasis on successful love relationships); diverse sexual lifestyles; sexual dysfunctions and therapy; and enhancement of one's own sexual awareness and pleasure and that of one's partner.

PSY 4290 Psychology of Women (3 q.h.) Examines women, historically and in contemporary life, including their social roles and their behavior as determined genetically, physiologically, and psychologically. Includes discussion on the implications for women's future lifestyles, roles, and contributions.

PSY 4351 Physiological Psychology (3 q.h.)
Introduces how nerves function and work together in the nervous system; how our sense organs provide the brain with information about the outside world; how the brain acts to produce behavior; and how such psychological concepts as perception, learning, motivation, arousal, and emotion may relate to nervous system activity. *Prereq.* PSY 4111 or PSY 4112 or equiv.

PSY 4352 Drugs and Behavior (3 q.h.)
Considers the application of quantitative behavior techniques in animals and humans to determine the behavioral effects of pharmacological agents. Includes systematic survey of experimental literature.

PSY 4372 Abnormal Psychology 1 (3 q.h.)
Diagnosis, symptomatology, etiology, and therapy of anxiety disorders, somatoform, and dissociative disorders. Introduction to the major forms of psychotherapy, including psychoanalysis, client-centered, behavioral and cognitive therapy. *Prereq.* PSY 4112 or equiv.

PSY 4373 Abnormal Psychology 2 (3 q.h.)
Continuation of PSY 4372. Diagnosis symptomatology, etiology, and therapy of schizophrenia, mood disorders, psychophysiological disorders, anti-social personality disorders, and organic disorders. Introduction to the somatic therapies. *Prereq.* PSY 4372.

PSY 4381 Sensation and Perception (3 q.h.)
Introduces the nature of the perceptual world, the nature of object recognition and identification, spatial organization, contextual effects, learning and perception, and the influence of attitudinal, motivational, and personality factors on perception. *Prereq.* PSY 4111 or equiv.

PSY 4471 Psychological Therapies (3 q.h.)
Studies techniques used for treating deviant behavior, from classical psychoanalytical therapies through methods of behavior modification. *Prereq.* PSY 4374 or equiv.

PSY 4561 Experimental Psychology 1 (3 q.h.)
Students conduct experiments focusing on the scientific method in the design, execution, analysis, and reporting of psychological investigations. *Prereq.* PSY 4222 and 120 q.h.

PSY 4562 Experimental Psychology 2 (3 q.h.)
Continuation of PSY 4561. *Prereq.* PSY 4561.

PSY 4563 Experimental Psychology 3 (3 q.h.)
Continuation of PSY 4562. *Prereq.* PSY 4562.

PSY 4611 Senior Seminar in Psychology (3 q.h.)
Small groups of students meet to discuss topics of mutual interest in psychology. Each seminar has a different focus, depending upon the student group and the instructor. *Prereq.* PSY 4561 and PSY 4562.

PSY 4813 Field Work in Psychology (6 q.h.)
Designed to enhance career development by allowing students to earn credit for the application of their academic backgrounds to practical problems in the work place. See page 24 for details.

PSY 4815 Advanced Tutorial 1 (3 q.h.)
Opportunity to take an upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

PSY 4816 Advanced Tutorial 2 (3 q.h.)
See PSY 4815.

PSY 4820 Independent Study 1 (3 q.h.)
Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

PSY 4821 Independent Study 2 (3 q.h.)
See PSY 4820.

PSY 4822 Independent Study 3 (3 q.h.)
See PSY 4820.

PSY 4891 Honors Program 1 (4 q.h.)
Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

PSY 4892 Honors Program 2 (4 q.h.)
See PSY 4891.

PSY 4893 Honors Program 3 (4 q.h.)
See PSY 4891.

PURCHASING

(See Operations Management)

RADIOLOGIC TECHNOLOGY

RAD courses (RAD 4085 through RAD 4124) are only open to admitted students.

RAD 4085 Radiologic Science 1 (formerly RAD 4102) (3 q.h.)

Basic concepts of physics, units of measurement, Newton's law of motion, work, energy, atomic theory of matter, electric currents, magnetism, generators, motor production, control of high voltage, and X-ray production are covered. *Prereq. MTH 4110.*

RAD 4086 Radiologic Science 2 (formerly RAD 4103) (3 q.h.)

Topics include interaction of X-rays and matter; modern X-ray tubes; X-ray circuits; fluoroscopic systems; and properties of solids, liquids and gasses. Also covers temperature, heat transfer and their application. *Prereq. RAD 4085.*

RAD 4100 Radiologic Technology Orientation 1 (3 q.h.)

Examines history of X-radiation, radiology department organization, medical terminology, patient care and nursing procedures, and contrast media.

RAD 4101 Radiologic Technology Orientation 2 (3 q.h.)

Study of medical and surgical diseases. *Prereq. RAD 4100.*

RAD 4104 Principles of Radiology 1 (4 q.h.)

Practical, basic radiation protection and the principles of positioning patients for radiographic studies are covered. *Prereq. RAD 4100.*

RAD 4105 Principles of Radiology 2 (4 q.h.)

Explores principles of precise body positioning for advanced radiographic studies. *Prereq. RAD 4104.*

RAD 4106 Radiologic Photography and Exposure 1 (4 q.h.)

Examines basic principles of image formation, electromagnetic spectrum, X-ray tube construction, factors controlling radiographic quality and patient exposure.

RAD 4107 Radiologic Photography and Exposure 2 (4 q.h.)

Examines mathematical formulas used in radiography. Includes in-depth study of sensitometry, phototiming principles, radiographic film techniques and electronic image capture and recording. *Prereq. RAD 4086 and RAD 4106.*

RAD 4108 Radiology Practicum 1 (formerly RAD 4116) (3 q.h.)

Students apply theoretical principles by performing radiographic procedures under supervision in a direct patient care setting. Emphasizes patient safety, radiation protection, and basic, routine diagnostic procedures. *Prereq. RAD 4104 and RAD 4106. Requires liability insurance coverage.*

RAD 4109 Radiology Practicum 2 (formerly RAD 4117) (3 q.h.)

Continuation of RAD 4108. Emphasizes routine diagnostic procedures, including fluoroscopy, operating room and portable radiography. *Prereq. RAD 4108 and RAD 4105. Requires liability insurance coverage.*

RAD 4110 Radiology Practicum 3 (formerly RAD 4118) (3 q.h.)

Continuation of RAD 4109. Emphasizes advanced diagnostic procedures, including invasive and interventional studies. Minor rotations are scheduled for related imaging departments. *Prereq. RAD 4109 and RAD 4107. Requires liability insurance coverage.*

RAD 4111 Radiology Practicum 4 (formerly RAD 4119) (3 q.h.)

Continuation of RAD 4110. Final clinical practicum leads to demonstration of accomplishment of terminal clinical competencies. *Prereq. RAD 4110. Requires liability insurance coverage.*

RAD 4123 Radiographic Lab 1 (0 q.h.)

Energized x-ray laboratory activities designed to complement RAD 4106 and RAD 4104.

RAD 4124 Radiographic Lab 2 (0 q.h.)

Continuation of RAD 4123. Designed to complement RAD 4107 and RAD 4105.

RAD 4130 Ultrasound Physics and Instrumentation (3 q.h.)

Introduces the physics of ultrasonographic imaging. Topics include the nature of ultra-

sound, propagation of ultrasound through tissues, and the construction and generation of ultrasound transducers. Discussions of ultrasonographic instruments include doppler, pulse echo devices, and image storage/display media. Covers quality assurance, bioeffects and safety concerns of ultrasonographic imaging. *Prereq.* MTH 4111.

RAD 4131 Abdominal Ultrasonography 1 (3 q.h.)

Introduces the fundamentals of ultrasonographic imaging of major organs of the adult abdomen. Discusses patient preparation, exam protocol and follow-up patient care. Basic scanning techniques along with image recognition of the gastrointestinal, biliary and urinary tracts. *Prereq.* RAD 4304 or RAD 4307 and RAD 4130.

RAD 4132 Echocardiography 1 (3 q.h.)

Introduces the fundamentals of ultrasonographic imaging of the adult cardiovascular system. Discusses cardiac anatomy and physiology, ultrasonographic equipment and operation, scanning positions, M-mode, two-dimensional and doppler echocardiography. *Prereq.* RAD 4304 or RAD 4307 and RAD 4130.

RAD 4133 Obstetrics and Gynecological Ultrasound 1 (3 q.h.)

Introduces the fundamentals of ultrasonographic imaging of structures in the adult female pelvis. Discusses normal pelvic anatomy and physiology, patient exam preparation, equipment operation, scanning protocols and image recognition. *Prereq.* RAD 4304 or RAD 4307 and RAD 4130.

RAD 4134 Pediatric Echocardiography (3 q.h.)

Introduces the fundamentals of echocardiographic imaging on pediatric patients. Discusses normal anatomy, normal hemodynamics, congenital and acquired pathologies, instrumentation and scanning techniques. Stresses the understanding of ancillary recording modalities and functional assessments. *Prereq.* RAD 4304 or RAD 4307 and RAD 4130.

RAD 4141 Abdominal Ultrasonography 2 (3 q.h.)

Introduces students to advanced principles of ultrasonographic imaging of the adult abdomen. Emphasis on the evaluation of the abdomen for specific diseases. Discusses linkage between medical laboratory test re-

sults and ultrasound exam protocols. Recognition of common pathologies of major abdominal structures will be accented. *Prereq.* RAD 4131.

RAD 4142 Echocardiography 2 (3 q.h.)

Introduces advanced principles of ultrasonographic imaging of the adult cardiopulmonary system. Emphasis on developing an understanding of specific exam protocols that will demonstrate precise cardiopulmonary structures. Discusses new state-of-the-art imaging modalities. *Prereq.* RAD 4132.

RAD 4143 Obstetrics and Gynecological Ultrasound 2 (3 q.h.)

Introduces advanced principles of ultrasonographic imaging of the female pelvis. Emphasis on demonstrating selected obstetrical and gynecological diseases and neoplasms ultrasonography. Stresses patient preparation, exam protocol and recognition of normal variants. *Prereq.* RAD 4133.

RAD 4170 Magnetic Resonance Imaging 1 (3 q.h.)

A comprehensive overview of the physics of magnetic resonance imaging. Stresses basic imaging concepts and various techniques associated with MRI exams. Discusses patient screening and necessary safety guidelines required to work in an M.R.I. department. *Prereq.* RAD 4304 or RAD 4307. *Must be a registered (A.R.R.T.) radiologic technologist.*

RAD 4300 Advanced Radiologic Technology 1 (3 q.h.)

Advanced radiographic examinations including mammography, genitourinary, operating room and interventional procedures are explored. Contrast media, patient considerations, and specialized equipment are also covered. *Prereq.* RAD 4105 and RAD 4107.

RAD 4301 Advanced Radiologic Technology 2 (3 q.h.)

Special procedures including cardiovascular procedures, neuroradiology, and selective interventional studies are explored. Exam methodology, specialized equipment, and contra-indications are also covered. *Prereq.* RAD 4300.

RAD 4302 Contemporary Studies in Radiologic Technology (3 q.h.)

Current topics in medical radiography are discussed and emerging trends explored. Guest speakers will include specialists in the field. *Open only to Radiologic Technology degree candidates.*

RAD 4307 Cross-Sectional Anatomy (formerly RAD 4304) (3 q.h.)

Introduces regional approach to anatomy. Reviews standard anatomy, with emphasis on relations of organs and structures to transverse and longitudinal section appearance. *Prereq. BIO 4161-4167.*

RAD 4308 Radiation Protection—Radiobiology (formerly RAD 4306) (3 q.h.)

Topics include atomic structure, properties of radioactive materials, units of radiation, long and short-term biological effects, lifespan shortening, radiation in detection and survey instruments, radiographic facilities design, quality assurance principles, resolution of radiation to patients, federal X-Ray standards. *Prereq. RAD 4107.*

RAD 4400 Anatomy of the Head and Neck (3 q.h.)

Explores anatomy of the head and neck in regional approach. Both standard and sectional anatomy are presented. Topics: brain, orbits, nasal cavity and paranasal sinuses, oral cavity and pharynx, larynx, thyroid and salivary glands; angiology of head and neck. *Prereq. RAD 4304 or RAD 4307 or consent of instructor.*

RAD 4450 Computerized Body Tomography Pathology (3 q.h.)

Studies abnormal anatomy of the neck, thorax, abdomen, and pelvis as demonstrated by computed tomography. Appropriate correlations made to normal anatomic structure. *Prereq. RAD 4304 or RAD 4307 or consent of instructor.*

RAD 4460 Medical Imaging Quality Assurance (3 q.h.)

Establishing, conducting, and interpreting the results of a medical imaging quality assurance program are discussed. Covers basic imaging chain, film characteristics and sensitometry, test equipment and operation, data collection and interpretation. *Prereq. RAD 4301 or equiv.*

REAL ESTATE

RE 4301 Real Estate Fundamentals 1 (3 q.h.)
Introduction to the basic principles and terminology of real estate useful in various real estate business practices.

RE 4302 Real Estate Fundamentals 2 (3 q.h.)
Examines practices of real estate brokerage, including real estate appraisal, finance, development, management, and investment. Upon successful completion of RE 4301 and RE 4302, students may take the Massachusetts broker's or salesperson's examination. *Prereq. RE 4301.*

RE 4303 Real Estate Fundamentals (Intensive) (6 q.h.)

Same as RE 4301 and RE 4302.

RE 4305 Real Estate Title Examination (3 q.h.)

Review of the general principles of abstracting and the function of the Registry of Deeds in the real estate business. General principles of title examinations are explored in detail, with attention given to recording deeds and the transfer of title in the conveyance of real estate. The function of the land court and registered land is also treated. Prepares the students for a possible career in title examination and may require field work in the form of activities to be performed at the Registry of Deeds.

RE 4323 Real Estate Appraisal 1 (3 q.h.)

Fundamental survey of the appraisal of single-family residences. Examines city or town neighborhood influences, site evaluation, building diagnosis, depreciation, the various approaches to value, and appraisal report preparation. *Prereq. RE 4302.*

RE 4324 Real Estate Appraisal 2 (3 q.h.)

Specialized overview of the appraisal of income properties. Includes application of the cost, market, and income approaches to apartment buildings and other commercial and industrial properties and of the various methods of capitalization and residual techniques. *Prereq. RE 4323.*

RE 4328 Real Estate Financial Analysis 1 (3 q.h.)

Analysis of how to critically examine and analyze any proposed real estate investment. Explores in detail the financial aspects of acquisition, ownership, and disposition, and considers taxation of investments, forms of

property ownership (organization of the venture), analysis of operating statements, financial accounting, use of leverage, "tax sheltered" investments, and special situations. Develops criteria of risk and return on investment (ROI) that should be established by various types of investors. Spreadsheets utilized. *Prereq.* RE 4324 or instructor's permission.

RE 4329 Real Estate Financial Analysis 2 (3 q.h.)

Detailed analysis of the risks and rewards of real estate investments and problems involved in financing income properties, using case studies, homework problems, and class discussion and debate. Stresses class participation. *Prereq.* RE 4328.

RE 4330 Real Estate Financial Analysis (Intensive) (6 q.h.)

Same as RE 4328 and RE 4329. *Prereq.* RE 4324.

RE 4341 Real Estate Law 1 (3 q.h.)

Covers private real estate law, including ownership rights in land, leasehold rights, and easements in the land of another; legal forms of ownership; the transfer and acquisition of title and of other interests; recording of deeds, leases, and other instruments; and the landlord-tenant relationship.

RE 4342 Real Estate Law 2 (3 q.h.)

Includes topics such as public real estate law, including government powers, rights, and controls on privately owned real estate; zoning and subdivision controls; conservation controls; taxation of real estate; rent controls; and eminent domain. *Prereq.* RE 4341.

RE 4343 Real Estate Law (Intensive) (6 q.h.)

Same as RE 4341 and RE 4342.

RE 4344 Property Management (formerly Real Estate Management 1) (3 q.h.)

Prepares students for the practical problems of real estate management. Stresses the requisite day-to-day management of commercial, industrial, and residential properties as well as the need for a management strategy relating to long-term property values. *Prereq.* RE 4302 or instructor's permission.

RE 4355 Real Estate Instructor Training (0 q.h.)

This course is recognized by the Massachusetts Board of Real Estate for the purposes of certification by the Massachusetts Board of

Real Estate Registration. Participants must have held a Massachusetts Broker's license for a minimum of two (2) years to be eligible. Topics will include techniques for conveying knowledge of real estate principles and practices, including answering questions, presenting alternative points of view, and focusing on student learning outcomes. Potential instructors of real estate will also be exposed to the importance of learning styles, speech patterns and overall presentation of course material. Teaching aides such as audiovisual enhancements will be examined, as will techniques for managing the learning environment effectively. Meets for a total of 30 classroom hours in an intensive seminar format utilizing research projects, classroom presentations and case studies. *Prereq.* RE 4302 or permission of instructor and Massachusetts Broker's license.

RE 4600 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

RE 4601 Honors Program 2 (4 q.h.)

See RE 4600.

RE 4602 Honors Program 3 (4 q.h.)

See RE 4600.

RE 4701 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

RE 4702 Independent Study 2 (3 q.h.)

See RE 4701.

RE 4703 Independent Study 3 (3 q.h.)

See RE 4701.

RE 4800 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

RE 4801 Advanced Tutorial 2 (3 q.h.)

See RE 4800.

SPEECH - LANGUAGE PATHOLOGY AND AUDIOLOGY

SLA 4101 Introduction to Speech and Hearing (3 q.h.)

Offers an overview of disorders of speech and hearing and their treatment, and a review of normal speech and hearing development. Requires clinical observations of persons with speech, language, and hearing disorders.

SLA 4201 Anatomy and Physiology of Vocal Mechanisms (3 q.h.)

Offers an in-depth study of the static structure, musculature, and physiology of the speech mechanism. Emphasizes current research in speech physiology. *Prereq.* SLA 4101.

SLA 4300 Language Acquisition (3 q.h.)

Analyzes the emerging semantic and syntactical aspects of language in normal and atypical children. Discusses current theory and research in language acquisition. Requires clinical observations of children with normal and atypical language patterns.

SLA 4301 Phonetics and Developmental Phonology (3 q.h.)

Offers basic training in auditory recognition and symbolization of phonemes and allophones in major American dialects. Stresses static and dynamic articulatory descriptions. Also includes a review of the developmental sequences of phonemic. *Prereq.* SLA 4101 and SLA 4201.

SLA 4303 Introduction to Audiology (3 q.h.)

Focuses on the basic techniques of audiometric testing and hearing conservation, including a review of basic hearing sciences and a prepracticum and laboratory experience in hearing testing.

SOCIOLOGY- ANTHROPOLOGY

SOA 4100 Physical Anthropology (3 q.h.)

Introduction to elements of physical anthropology, covering such subjects as primates, fossil humans and evolution, problems of heredity and genetics, race and racial classifications. *Not open to students who have credit for SOC 4010.*

SOA 4101 Cultural Anthropology: Kinship Societies (formerly Preliterate Societies) (3 q.h.)

Introduction to sociocultural anthropology through the study of societies that have been called "tribal" or "primitive." Examines a range of contemporary societies that have no class structures, their social and cultural institutions, their subsistence strategies, and their efforts to remain independent people today.

SOA 4102 Cultural Anthropology: State Societies (formerly Industrial Societies) (3 q.h.)

Examines the social relations and cultural dynamics in peasant societies. Discusses the transformation of peasants into workers and the patterns of industrialization in the post-colonial world. Addresses issues of cultural diversity and social stratification in industrial societies.

SOA 4103 Anthropology Intensive A (6 q.h.) Same as SOA 4100 and SOA 4101.

SOA 4104 Anthropology Intensive B (formerly Anthropology Intensive) (9 q.h.) Same as SOA 4100, SOA 4101, and SOA 4102.

SOA 4105 Anthropology Intensive C (6 q.h.) Same as SOA 4101 and SOA 4102.

SOA 4110 Human Nature: Myths and Realities (3 q.h.)

This course examines debates about whether or not violence, competition, male dominance, and power struggles are inborn in people, or to what extent they can be documented as social and cultural creations. Cross-cultural data and data from ape and prehuman societies will be used to address the question. *Prereq.* SOA 4100 or SOA 4101 or SOA 4102.

SOA 4146 Peasant Societies in a Changing World (3 q.h.)

Examines changes affecting traditional peasant cultures in the non-Western and Western worlds. Includes the processes occurring in situations involving culture contact, conquest, and colonialism.

SOA 4155 Individual and Culture (3 q.h.)

Focuses on cross-cultural comparisons of the socialization and acculturation of children and adults with respect to roles, values, and personality. Examines theories and methods used in psychological anthropology.

SOA 4160 Gender Roles and the Family (formerly Sex, Sex Roles, and the Family) (3 q.h.)

Analyzes popular and scientific notions about sex and the family by examining the social patterning of interactions in our culture, other cultures, and other species. Emphasizes the changing relationships between men and women.

SOA 4221 Culture and Medicine (3 q.h.)

Perspectives on medicine and health care are rapidly changing. As costs skyrocket, alternatives to "curative" medicine are being sought. Uses an anthropological perspective and draws on the vast amount of cross-cultural literature in exploring the impact of sociocultural factors on the incidence, definition, treatment, and prevention of illness as well as the organization of health services.

SOA 4266 Folklore (3 q.h.)

Focuses on Folklore, art, and song in various societies and how they are studied. Examines contemporary American materials.

SOA 4322 Culture Theory (3 q.h.)

What is culture? How do we explain cultural phenomena, including culture change? This course examines different classical and contemporary theories of culture: Boasian, functionalist, structuralist, marxist, post-structuralist, and postmodernist.

SOA 4430 Native North American Peoples (3 q.h.)

Past and present circumstances of a number of native North American peoples are explored.

SOA 4431 African Peoples and Cultures (3 q.h.)

Topics include African geography, prehistory, and culture; the spectrum of societal complexity ranging from Mbuti egalitarianism to Ashanti federation; and the problems of political, economic, and social change in contemporary Africa.

SOA 4434 Latin American Peoples and Cultures (3 q.h.)

Explores the processes of socioeconomic and cultural change in Latin America. Examines a selection of precolonial, colonial, and contemporary societies. For contemporary societies, the focus is on the relationship of local communities (peasant, worker, ethnic) to national cultures and global political and economic structures.

SOA 4470 Religion in Cross-Cultural Perspective (3 q.h.)

Comparative analysis of the rituals, beliefs, and religious institutions of various groups.

SOCIOLOGY**SOC 4010 Principles of Sociology 1** (4 q.h.)

Introduction to basic concepts and theories relating to the study of people as participants in group life. Emphasizes socialization, culture, social structure, primary groups, family, social stratification, and population. *For Alternative Freshman-Year students only. Not open to students who have credit for SOC 4100 or SOC 4101.*

SOC 4011 Principles of Sociology 2 (4 q.h.)

Continuation of SOC 4010. Emphasizes critical analysis of American society with particular attention to problems of social, political, urban, and industrial change. *For Alternative Freshman-Year students only. Not open to students who have credit for SOC 4101 or SOC 4102. Prereq. SOC 4010 equiv.*

SOC 4100 Roles, Culture, and the Individual (formerly Fundamental Issues in Sociology) (3 q.h.)

Examines basic theoretical perspectives, research methods, and concepts of sociology, including society, status and role, socialization, and social groups. *Not open to students who have credit for SOC 4010.*

SOC 4101 Inequality and Institutions (formerly The Individual and Social Roles) (3 q.h.)

Examines how an individual's experience in society is shaped by cultural institutions and beliefs, and structures of interaction. Topics include patterns of deviance (crime, drugs), gender roles, and sexuality. *Not open to students who have credit for SOC 4010 or SOC 4011. Prereq. SOC 4100 or equiv.*

SOC 4102 Institutions and Social Change (formerly Critical Issues Facing Society) (3 q.h.)

Examines important social factors, including business and industry, population and ecology, science and technology, class, and race and ethnic relations. *Not open to students who have credit for SOC 4011. Prereq. SOC 4100 or equiv.*

SOC 4103 Introduction to Sociology Intensive A (formerly Sociology Intensive) (9 q.h.)
Same as SOC 4100, SOC 4101, and SOC 4102.

SOC 4104 Introduction to Sociology Intensive B (6 q.h.)
Same as SOC 4100 and SOC 4101.

SOC 4120 Sociology of Boston (3 q.h.)
The city is a laboratory for exploring the people's search for a lifestyle and the satisfaction of their needs. The city of Boston from the perspectives of environmental development, neighborhood and intergroup relations, institutional services, and symbolic meanings. Includes field trips with workbook and requires use of documentary and literary sources for term paper report. *Does not meet elective requirements for Sociology-Anthropology major.*

SOC 4125 Social Problems (3 q.h.)
Contemporary American social problems and the application of sociological concepts, methods, and principles to these problems are explored.

SOC 4147 Urban Life (formerly Urban Sociology) (3 q.h.)
Topics include various causes, characteristics, and effects of urbanization in several different cultures. Gives specific attention to the problem of urban and suburban living and the changing structure of the city.

SOC 4154 Sex and Gender Roles in Society (formerly Sex in Society: The Study of Sex Roles) (3 q.h.)
Explores historical and contemporary developments, examining the ways in which men's and women's changing roles are related to society at large.

SOC 4155 Family Relations (formerly Sociology of the Family) (3 q.h.)
Studies the family as a social institution in several selected cultures; family interrelations with political, economic, and educational institutions; and the changing nature of the family.

SOC 4156 Violence in the Family (formerly Sociology of the Family 2) (3 q.h.)
Examines physical, emotional, and sexual violence that occurs in families, emphasizing child and spouse abuse. Analyzes definitions, prevalence, causes, prevention, and

treatment of specific cases of violence. Primary focus is on social and policy issues and problems of legal intervention.

SOC 4170 Race and Ethnic Relations (3 q.h.)
Focuses on relationships among various racial, national, cultural, and religious groups, emphasizing the development of black-white relationships in American society. Also covers the problems of contemporary minority peoples in American and other societies.

SOC 4175 Work and Professions (formerly Sociology of Work) (3 q.h.)
Explores the world of work, focusing on the development of occupational cultures, the nature of careers, and the meanings and implications of professionalization. Students are encouraged to do a project on a career they are considering or one in which they have had practical experience.

SOC 4177 Gender in the Workplace (3 q.h.)
This course is designed to present an interdisciplinary exploration of issues related to gender differences and equality in the workplace. It is structured into three sections—theory, history, and policy—to provide real world and diverse perspectives on the subject. Topics to be discussed include women's voice, gender psychology, gender and historical analysis, race and gender, education and professionalism, comparable worth, the men's movement, the glass ceiling, leadership and management styles, among others.

SOC 4178 Cultural Diversity in the Workplace (3 q.h.)
A study of multiculturalism and diversity at work by focusing on issues such as changing workforce composition, international competition, sexism, racism, ageism, and nationalism.

SOC 4185 Deviant Behavior (formerly Sociology of Deviant Behavior) (3 q.h.)
Topics include a variety of social problems and their relation to the organization of society. Pays particular attention to alcoholism, sexual offenses, drug abuse, mental disorders, and other responses to conditions of urban industrial society.

SOC 4186 Social Control (3 q.h.)
Discusses group membership as a determinant of behavior, including analysis of status and role, patterns of authority, power, and group ideology as factors in the evaluation of conduct.

SOC 4190 Juvenile Delinquency (3 q.h.)
Emphasis on factors involved in juvenile delinquency and their implications for prevention, rehabilitation, and treatment.

SOC 4195 Drugs and Society (3 q.h.)
Introduction to the sociology of drugs. Examines social definitions of drugs, conditions of their use, and socialization into drug use. Considers deviant drug use and effects of social control on definitions and use. A range of licit and illicit drugs is considered.

SOC 4202 Sociology of Drinking (3 q.h.)
Exploration of how different groups and societies organize drinking as a social act, and the consequences of that organization. Covers the cultural meaning assigned to drinking, the social elements found in all drinking situations, how members of social groups learn how to drink, and the social and psychological functions of drinking.

SOC 4203 Sociology of AIDS (3 q.h.)
Studies the emergence of HIV and AIDS, the transmission of the disease, and the various effects of the disease on individuals. Also explores government and media reactions to AIDS, racism and homophobia in the public's response to AIDS, and the "moral status" of the disease.

SOC 4205 Law and Society (3 q.h.)
Topics include functions of law in modern society; legislation, litigation, and adjudication as social processes; the legal profession, the courts, and the administration of justice; laws and judicial decisions on controversial social issues; and laws regulating domestic, industrial, and other major social relationships.

SOC 4215 Medical Sociology (3 q.h.)
Examination of sociological concepts and research relating to patterns of behavior in the areas of health and disease. Emphasizes the family, community, medical organizations, class, and status as social subsystems related to the field of health.

SOC 4225 Social Gerontology (3 q.h.)
Analyzes issues and questions of aging, with special attention to social and economic consequences of the aging process, such as retirement and productivity, health care problems, nursing home residences, widower and widowhood, and the approach of death. Gives examples relating to aging in other cultures in a search for new answers to social

problems of aging in the United States. Discusses how to anticipate, cope with, and even prevent problems of aging that concern self, family, and clients or patients.

SOC 4226 Work, Leisure and Aging (3 q.h.)
Includes discussion of theory and practice of leisure time activities as they relate to the older adult. Examines the social, cultural, and economic aspects of work, including housework, and the meaning of leisure. Explores various types of leisure activities and resources as well as how to build skills and design and implement activities.

SOC 4235 Death and Dying (3 q.h.)
Examines the treatment of death and dying, including problems faced by health care professionals, family members, institutions, the funeral industry, and the dying themselves. Covers cross-cultural perspectives, the social distribution of mortality, the changing nature of death, and the ethical problems in determining life and death with particular attention to such issues as abortion, suicide, and ceasing medical intervention.

SOC 4240 Sociology of Human Service Organizations (3 q.h.)
Explores the contradiction between what human service organizations set out to do and what they actually accomplish. Includes how human service organization goals are defined, how clients become labeled, and the societal constraints placed on clients, workers, and the organizations.

SOC 4241 Human Services Professions (3 q.h.)
Covers human services, viewed from the perspectives of the recipient, the worker, and the society at large. Includes analysis of why they are needed, how agencies and programs have developed, and the basic skills, attitudes, values, and knowledge required of the human service worker today.

SOC 4245 Poverty and Inequality (formerly Sociology of Inequality) (3 q.h.)
Historical analysis of American class and ethnic differences, drawing on comparisons with other countries. Includes critical evaluation of sociological research and theories relating to the causes and effects of poverty and societal responses to it. Suitable for students in applied fields, such as nursing, criminal justice, education, allied health, pre-med, and pre-law.

SOC 4255 Sociology of Sport (3 q.h.)

Topics include games and sport from a sociological perspective, with particular reference to contemporary American society. Includes the role of play in modern society, the social organization of specific games and sports, and the relation of organized sport to the larger society.

SOC 4260 Introduction to Social Work Practice (3 q.h.)

Explores the functions of the helping profession of social work, its settings and methods. Covers specific techniques, such as interviewing, history-taking, and recording skills.

SOC 4276 Popular Culture (3 q.h.)

(formerly Sociology of Popular Culture)

Significance of expressions of popular culture, such as film, television, music, and literature is explored. Examines media production, organization, technology, and audience consumption. Also covers the relationship between popular culture and existing socio-economic institutions.

SOC 4300 Social Theory 1 (3 q.h.)

Historical survey of sociological theorists, including the work of de Tocqueville, Comte, Marx, Durkheim, and Cooley. *Prereq.* Instructor's permission or 12 q.h. in *Sociology-Anthropology*.

SOC 4301 Social Theory 2 (3 q.h.)

Covers major theoretical issues in sociology. Discussion concentrates on systematic questions and topics rather than on particular theorists, but material is drawn from such theorists as Weber, Simmel, Thomas, Mannheim, Merton, and Parsons. *Prereq.* SOC 4300 or *equiv.*

SOC 4302 Social Theory 3 (3 q.h.)

Seminar focuses on questions of theoretical interest, such as the problem of order, the problem of change, and the role of the individual in change. Students present papers in class. *Prereq.* SOC 4301 or *equiv.*

SOC 4303 Social Theory (Intensive) (9 q.h.)

Same as SOC 4300, SOC 4301 and SOC 4302. *Prereq.* Instructor's permission or 12 q.h. in *Sociology-Anthropology*. *Not open to students who have credit for SOC 4300, SOC 4301, or SOC 4302.*

SOC 4310 Class, Power, and Social Change (3 q.h.)

Discusses theories of social equality and inequality as applied to the exercise of power

and to the growth and development of social movements and group conflict. Takes a large-scale, social-change point of view.

SOC 4320 Statistics for Social Sciences (3 q.h.)

Designed for criminal justice, history, political science, and sociology majors, this course studies the uses of statistics. Covers methods of tabulating, presenting, and summarizing data including probability, sampling, the basic descriptive and inferential statistics including measures of central tendency, measures of correlation, and test of significance. (*Not open to students who have completed SOC 4332.*)

SOC 4331 Research Methods 1: Generating and Investigating Research Problems (3 q.h.)

Designed for criminal justice, history, political science, and sociology majors, this course explores fundamental concepts for generating and investigating research problems. Examines methods for basic and applied research. Emphasizes theory construction and includes data gathering, using research techniques such as interviews, questionnaires, observation and content analysis. Examines issues of measurement and causal reasoning. Students design a small study. *Prereq.* SOC 4320.

SOC 4333 Research Methods 2: Doing Social Research (3 q.h.)

Students complete the study designed in SOC 4331 focusing on the design, execution, analysis, and reporting of the investigation. Focuses on ethics and politics of research and interrelationship of social action, social research, and theory building. Culminates with the presentation of research papers. *Prereq.* SOC 4331.

SOC 4805 Field Work in Sociology (6 q.h.)

Designed to enhance career development by allowing students to earn credit for the application of their academic backgrounds to practical problems in the workplace. See page 24 for details. *Prereq.* completion of 15 q.h. in *Sociology* and Program Director's approval.

SOC 4815 Advanced Tutorial 1 (3 q.h.)

Opportunity to take an upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

SOC 4816 Advanced Tutorial 2 (3 q.h.)

See SOC 4815.

SOC 4820 Honors Program 1 (4 q.h.)
Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

SOC 4821 Honors Program 2 (4 q.h.)
See SOC 4820.

SOC 4822 Honors Program 3 (4 q.h.)
See SOC 4820.

SOC 4830 Independent Study 1 (3 q.h.)
Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

SOC 4831 Independent Study 2 (3 q.h.)
See SOC 4830.

SOC 4832 Independent Study 3 (3 q.h.)
See SOC 4830.

SPECIAL EDUCATION (See CRS, page 183)

TECHNICAL COMMUNICATIONS

TCC 4101 Technical Writing 1 (3 q.h.)
Introduction to basic technical writing skills, emphasizing selecting and organizing data. Includes audience analysis, research techniques, and descriptions of objects, mechanisms, and processes. Provides practice in descriptive writing, classification and definition, paragraphing, and preparing technical documentation outlines. Includes frequent technical writing exercises and projects applicable to both software and hardware writing tasks. *A writing proficiency test is given at the first class meeting.*

TCC 4102 Technical Writing 2 (3 q.h.)
Application of the information gathering, organizational, and technical writing skills acquired in TCC 4101 to more advanced projects. Extensive practice in formatting, organizing, writing, and editing technical reports. *Prereq.* TCC 4101.

TCC 4103 Technical Writing (Intensive) (6 q.h.)
Same as TCC 4101 and TCC 4102. *A writing proficiency test is given at the first class meeting.*

TCC 4105 Editing for Science and Technology (3 q.h.)
Covers fundamentals of editing as they apply to scientific, technical, and engineering

writing. Examines the role of the editor in business, industry, and the sciences; basic editorial services such as proofreading, copy and content editing, production editing, and project editing; analysis and critique of manuscripts; work with authors; the editor as writer and interviewer; and science interpretation and technical translation. Accelerated work for students already skilled in spelling and grammar. *Prereq.* TCC 4101 or instructor's permission.

TCC 4106 Advanced Editing for Science and Technology (3 q.h.)
Continuation of TCC 4105. *Prereq.* TCC 4105.

TCC 4110 Technical-Promotional Writing (3 q.h.)
Explores structure, style, and graphic presentation of technical-promotional writing in a high-tech environment. Students are trained to combine technical knowledge and writing skills in developing quality technical brochures, articles, product catalogs, demonstration kits, slide presentations, and video scripts. *Prereq.* TCC 4101, TCC 4102, or instructor's permission.

TCC 4301 Computer Software Technical Writing 1 (3 q.h.)
Introduction to the tasks and problems unique to software technical writing. Includes review of fundamental software concepts, the role and importance of software documentation, component parts of software technical manuals and their purposes, tutorial and reference functions of manuals, research tools for manual writing, and the writing process itself. *Prereq.* TCC 4101 and MIS 4102 or instructor's permission.

TCC 4302 Computer Software Technical Writing 2 (3 q.h.)
Continuation of TCC 4301. *Prereq.* TCC 4301.

TCC 4303 Seminar in Software Technical Writing (3 q.h.)
An advanced case-study seminar on contemporary problems in technical writing for the working or prospective writing professional. Emphasizes integrating the viewpoint of the software developer with the task-oriented needs of the end-user. Includes system manual design; computer design; modularity; and system evolution. *Prereq.* TCC 4302 or instructor's permission.

TCC 4304 Computer Software Technical Writing (Intensive) (6 q.h.)

Same as TCC 4301 and 4302. *Prereq.* TCC 4101 and MIS 4102 or instructor's permission.

TCC 4311 Instruction Manual Writing 1 (formerly Hardware Technical Manual Writing 1) (3 q.h.)

Introduction to the fundamentals of technical manual writing, including the theory and practice of manual design, organization, and content. Covers copyright law, product liability, graphic design, readability, manual specifications and standards, illustrations, and reproduction techniques. Emphasizes hardware operations manuals. Includes individual and class design and writing projects. *Prereq.* TCC 4101 and TCC 4102.

TCC 4312 Instruction Manual Writing 2 (formerly Hardware Technical Manual Writing 2) (3 q.h.)

Application of skills acquired in TCC 4311 to an entry-level technical manual writing project. Students elect individual or group writing and production projects for high-technology equipment or systems lacking adequate documentation. Includes instruction in writing safe, legible operating instructions and descriptions of installation procedures, principles of operation, and maintenance. Also covers manual changes and updates. *Prereq.* TCC 4311 or instructor's permission.

TCC 4313 Instruction Manual Writing Intensive (6 q.h.)

Same as TCC 4311 and TCC 4312. *Prereq.* TCC 4101 and TCC 4102.

TCC 4320 Proposal Writing (3 q.h.)

Background in the preparation of proposals, including how to analyze a request for proposal or bid set. Introduces the various types of proposals generated by industry and provides an opportunity to prepare a proposal in a simulated situation, through role playing and participation on a proposal preparation team. Includes considerable analysis and writing practice. *Prereq.* TCC 4102 or instructor's permission.

TCC 4330 The Business and Technical Presentation (3 q.h.)

Application of the principles of technical communication to audiovisual presentations. Includes audience analysis, techniques of organization, script preparation, media selection, the design and production of visuals,

the influence of physical factors on communication, and the elements of effective delivery. Participants prepare and deliver presentations and receive video playback and peer critiques.

TCC 4335 Introduction to On-line Documentation (formerly Introduction to Hypertext Development) (3 q.h.)

Designed to give students essential background in developing field of hypertext. Topics include theory and practice, authoring systems, hypermedia topologies and user navigation, hypermedia path mechanisms, and hypertext-based writing tools. *Prereq.* TCC 4101 and 4102.

TCC 4336 Medical Writing (3 q.h.)

Focuses on the scope of medical communications, the role of technology and the medical communicator, patient education, clinical trial reporting, technical/legal issues such as FDA and UL approvals, pharmaceutical writing, and medical editing. *Prereq.* TCC 4101 and 4102.

TCC 4337 Writing for the Biotechnology Industry (3 q.h.)

Examines technical communication in the field of biotechnology, including the areas of health care, agriculture, and industrial "bioprocessing." Explores the role of the biotechnology technical communicator in areas such as marketing and business communication. Covers documentation common in the research, development, and marketing of new products. Provides practice in structuring information into formats such as research articles, development proposals, protocols and instructions, and technical briefings with emphasis on audience analysis as well as content and purpose. Introduces stylistic conventions standard in the life sciences. Integrates documentation planning and project management into the product development cycle.

TCC 4340 Documentation Development and Completion (formerly Technical Writing Portfolio Development) (3 q.h.)

In this final course before graduation, students apply organizational and communications skills acquired in the technical writing program. Each student is responsible for finding a "real-world" product that needs technical documentation. Working with the instructor, the student then develops the documentation from an initial outline to a final completed manual that will be used

with the product. (Not a regularly scheduled course. Students must contact Liberal Arts Office to register to work with an instructor.)

TCC 4350 Concepts of Modern Technology 1* (3 q.h.)

Surveys applications of physical science to mechanical devices and introduces the laws of thermodynamics. Considers the influence of material properties on design and manufacturing techniques. *Prereq.* MTH 4006 or equiv.

TCC 4351 Concepts of Modern Technology 2* (3 q.h.)

Surveys applications of physical science to electrical and electronic devices and introduces electronic circuit design. Includes a comparison of various devices used for amplification and control, and a study of the development of the electronic digital computer and the components involved in the manufacture of computers. *Prereq.* TCC 4350.

TCC 4802 Advanced Tutorial 1 (3 q.h.)

Opportunity to take an upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

TCC 4803 Advanced Tutorial 2 (3 q.h.)

See TCC 4802.

TCC 4805 Field Work in Technical Communications (6 q.h.)

Designed to enhance career development by allowing students to earn credit for the application of their academic backgrounds to practical problems in the workplace. See page 24 for details. *Prereq.* completion of 18 q.h. in *Technical Communications* and Program Director's approval.

THEATRE (formerly Drama)

THE 4101 Introduction to Theatre (formerly DRA 4101) (3 q.h.)

How a theatrical performance is made through the eyes of those who make it: writers, producers, actors, designers, and audience. Designed to increase the student's awareness of theatre as a business as well as to provide a basis for enjoyment of theatre as an art form dealing with ideas and emotion. Visits to local theatres and viewing of performances in the Boston area. Guest lectures by

practicing professionals. Cost of theatre tickets not included in tuition.

THE 4120 Acting for the Non-Actor (formerly DRA 4120) (3 q.h.)

Shakespeare said "All the world's a stage..." We are all actors in our private and professional lives. Basic acting principles and performance experiences can benefit anyone who interacts with other people. This course deals with stress, relaxation, presentation of self, status in relationships, and performance anxieties. Acting exercises assist the student in finding methods for dealing comfortably and positively with real-life situations.

THE 4140 Introduction to Acting 1 (formerly DRA 4140) (3 q.h.)

Physical preparation for the actor, including basic stage movement and deportment, control of the stage voice, analysis and establishment of characterization through observation and awareness of the body, and improvisations and short scenes.

THE 4141 Introduction to Acting 2 (formerly DRA 4141) (3 q.h.)

Psychological preparation for the actor, including analysis and establishment of characterization through memory, emotion, imagination, and recall; analysis of specific roles; the creation of a character analysis book; and improvisations and short scenes. *Prereq.* THE 4140 or instructor's permission.

THE 4145 Auditioning for the Stage (formerly DRA 4145) (3 q.h.)

Focuses on techniques, approaches, and attitudes that assist the actor in the casting process. Preparation for and presentation of monologues. *Prereq.* THE 4141 or instructor's permission.

THE 4150 Introductory Mime Workshop (formerly DRA 4150) (3 q.h.)

In-depth introduction to mime, featuring illusionary technique, silent acting, and the creation of material for mime theatre.

THE 4230 The Boston Theatre Scene (formerly DRA 4230) (3 q.h.)

Opportunity to view and critique live performances presented in the Boston area's major and "off-Broadway" theatres. Cost of theatre tickets not included in tuition.

*This is a Lowell Institute, School of Engineering Technology course, which is offered at a different tuition rate from that of University College.

THE 4250 Theatre Movement
(formerly DRA 4250) (3 q.h.)

Deals with relaxation, concentration, and the use of the body as a means of communication.

THE 4260 Voice Production

(formerly DRA 4260 Theatre Speech) (3 q.h.)
Focuses on breathing, vocal technique, and articulation.

TRANSPORTATION

TRN 4301 Elements of Transportation (formerly Elements of Transportation 1) (3 q.h.)
Introduction to regulatory, economic, and management aspects of transportation. Covers concerns of shipping industry, government, and carriers. Includes history of cost, rate-making, operations, entry, mergers, and intercity passenger and cargo carriage. Essential to students in business, law, or government.

TRN 4302 Introduction to Logistics (formerly Physical Distribution Management 1) (3 q.h.)

Introduction to the logistical role in the business structure. Focus is on time and place utility for distribution of goods. Covers transportation alternatives, inventory control, warehousing, location factors and customer service levels. Contemporary texts and, where appropriate, cases are used.

TRN 4304 Advanced Logistics (formerly Physical Distribution Management 2) (3 q.h.)
Analyzes in greater depth the role and activities of those involved in business decision making, emphasizing the transportation planning, setting customer standards and locations decisions in the design and operation of distribution systems. Contemporary texts, problems and appropriate cases are used. *Prereq.* TRN 4302.

TRN 4305 Traffic Management (formerly Traffic Management 1: Rates and Tariffs) (3 q.h.)

Includes the interpretation and use of tariffs. Examines classifications, rate scales, tariff rules, rate-making procedures, and ICC law and practice. *Prereq.* TRN 4301.

TRN 4316 Carrier Management (3 q.h.)

Explores the transportation system from the carrier viewpoint. Covers managerial response to a heavily regulated and rapidly

expanding environment. Includes carrier decision-making involving routes, scheduling, financing, and pricing of services.

TRN 4325 Management of Warehouse Operations (3 q.h.)

Management of warehouses is analyzed. Includes site selection, construction, finance, operations, measurement of performance, and warehouse technology.

TRN 4342 Transportation Loss, Damage and Other Claims (3 q.h.)

Covers rules, regulations, and other pertinent elements of transportation claims resulting from the loss or damage of cargo, overcharges and undercharges, and related carrier and shipper activities.

TRN 4350 International Transportation and Distribution Management (3 q.h.)

Examines the safe and efficient overseas transportation of products by air or water. Covers major indirect supporting business and agencies involved in the international movement of people and goods.

TRN 4600 Honors Program 1 (4 q.h.)

Opportunity to undertake an in-depth research study project. See page 24 for details. *Prereq.* 96 q.h., 3.5 q.p.a.

TRN 4601 Honors Program 2 (4 q.h.)

See TRN 4600.

TRN 4602 Honors Program 3 (4 q.h.)

See TRN 4600.

TRN 4701 Independent Study 1 (3 q.h.)

Opportunity to undertake special research. See page 24 for details. *Prereq.* 96 q.h., 3.0 q.p.a.

TRN 4702 Independent Study 2 (3 q.h.)

See TRN 4701.

TRN 4703 Independent Study 3 (3 q.h.)

See TRN 4701.

TRN 4800 Advanced Tutorial 1 (3 q.h.)

Opportunity to take upper-level course independently. See page 24 for details. *Prereq.* 87 q.h.

TRN 4801 Advanced Tutorial 2 (3 q.h.)

See TRN 4800.

Tuition and Fees

Tuition

Tuition for all credit courses is \$165 per quarter hour of credit. Charges for registration and tuition for special courses are at the rate specified for each course, with the exception of theatre and nontutorial courses. There is no reduction in fees for auditing courses.

Noncredit courses are charged at quarter-hour rates comparable to those of credit courses meeting on an equivalent contact-hour schedule.

Full payment of tuition and other related charges are due by the beginning of each quarter. The following are accepted methods of payment:

- Check or Money Order made payable to Northeastern University
- Mastercard, Visa or Discover. Payments may be made in person or by calling our 24 hour automated charge line. Within the (617) area code call (617) 373-2319; outside the (617) area code call 1-800-937-4067.
- Enrollment in the Three Payment Option described below.

Students are responsible for the prompt payment of all bills. If a bill has not been received by the first week of the quarter, please go to the Bursar's Office (254 Richards Hall) where a bill will be created for you.

Any discrepancies in your bill should be brought to the attention of the Bursar's Office. If there is a billing problem, pay the undisputed portion of the bill to avoid any additional late fees.

Tuition for Courses in Other Northeastern Departments or Colleges

University College students assigned to courses in other departments or colleges of the University are charged the tuition rate effective in the departments or colleges in which they are enrolled.

Initial Registration Fee

A nonrefundable \$10 registration fee for first-time University College students is billed along with tuition and applicable fees.

Three Payment Option

Northeastern University offers a three payment option plan. Information regarding this plan may be obtained at the Bursar's Office. Call 617-373-2270 or TTY 617-373-3881. There is a nominal fee for participation in this program.

Applications along with the initial payment of 1/3 plus the fee are due as described below:

Quarter
Fall
Winter
Spring
Summer

Application Deadline
September 21, 1996
January 11, 1997
March 29, 1997
June 14, 1997

Tuition Reimbursement

Many companies reimburse the student/employee upon successful completion of courses. In these situations the student is responsible for the payment of the bill at the beginning of the quarter or may select to use the Three Payment Option Plan. **Tuition may not be left unpaid pending reimbursement by an employer.**

Tuition Paid for by Employers

The student must provide the Bursar's Office with a purchase order or a statement from an officer of the company certifying that the company will pay the University directly. If there are stipulations associated with the payment agreement, such as a minimum grade level, then the student must either pay the University directly or enroll in the Three Payment Option.

Late Payment Fee

Bills for tuition and fees are payable in accordance with the due date shown. A late payment fee of \$75 is charged for failure to make payments in accordance with the prescribed regulations.

Delinquent Balances

In cases of student default on tuition payments, the student is liable for the outstanding tuition, as well as all reasonable collection costs and any legal fees incurred by the University during the collection process and may be subject to monthly interest charges.

Transcripts and other academic records will not be released until all financial obligations to the University have been met.

Veterans' Benefits

Any veteran covered by Public Law 89-358 should report to 126 Hayden Hall to fill out the proper enrollment forms.

Refunds

Tuition refunds may be granted through the first four weeks of a quarter based on the date the official withdrawal was received by the Registrar's Office. **Non-attendance does not constitute official withdrawal.**

Credit balances will be applied to future charges, unless the Bursar's Office receives other written instructions. Refunds will be credited according to the following schedule:

Official Withdrawal Filed within	Percentage of Tuition Refunded
First week of the quarter	100%
Second week of the quarter	75%
Third week of the quarter	50%
Fourth week of the quarter	25%
Fifth week of the quarter	0%

A different refund schedule may apply to courses that run less than a full quarter.

Low Rate for Intensives

University College offers a selection of six-quarter-hour courses. Intensives running on Friday evenings and Saturdays will be offered at a special reduced tuition rate of \$790 (\$200 less than the normal tuition). Intensives running Mondays through Thursdays will be offered at the special reduced rate of \$890 (\$100 less than the normal tuition). Check the current *Schedule Guide* for a list of these courses.

Fees

Student Center Fee

All students in University College on the Huntington Avenue campus are charged \$8.25 each quarter for the services available in the Student Center.

Laboratory Fees

Students taking laboratory courses should be prepared to purchase laboratory cards at the Cashier's Office, as directed by the department offering the course. Rates for the lab cards are as follows:

Art Studio Labs	\$35.00	Geology	\$50.00
Biology Laboratory	\$50.00	Medical Lab Science/	
Computer Graphics Lab	\$50.00	Phlebotomy	\$35.00
Chemistry Laboratory	\$65.00	Photography Lab	\$50.00

Special Rates

Nursing courses and the EMT Basic course are offered at special rates. Please consult the current *Schedule Guide* for those fees.

Music students enrolled in music instruction pay a special rate. For details contact Marjorie Atlas, University College Music Coordinator, 351 Ryder Hall, telephone 617-373-2440 or 617-373-2442.

Health Service Waiver Process

The University provides hospital insurance for all students who have matriculated, carrying a course load of nine credits or more or who are in a full-time program. This program is mandated by the Commonwealth of Massachusetts. You will be enrolled automatically in the University's plan, and the Health Fee will be charged to your Northeastern account.

Students who are covered under a comparable hospital insurance plan may waive the University-offered insurance program by filing a waiver available at the Bursar's Office. Forms must be filed with the Bursar's Office, 254 Richards Hall 617-373-2270, by the deadline dates.

Waivers submitted after the deadline will not receive a full reversal of the Health Fee.

Student Liability Insurance Fee

Students taking specific clinical or practicum courses are required to purchase liability insurance for an \$18.00 fee which covers one academic year, fall term through summer term. This requirement is specified in course descriptions.

Missed Final Examination Fee

Students absent from the regularly scheduled final examination at the end of a course may petition for a missed final examination. The fee for each examination requested by the student is \$50. The fee must be paid when the petition is filed in the Office of Academic and Student Affairs.

Transcripts

Students may request official transcripts of their grades at the Registrar's Office. There is a charge of \$2 per copy, payable in advance. Unofficial transcripts are issued free of charge. Transcripts will not be released until all financial obligations to the University are met.

Financial Aid

The Office of Financial Aid, located at 356 Richards Hall, offers several types of assistance to part-time and full-time University College students. All awards are based on financial need. Aid granted from programs sponsored by the federal or state government is dependent upon the amount of funding allocated to Northeastern University. Federal regulations require that students who receive financial aid funds be United States citizens or permanent residents.

Application Procedure

All students applying for aid must submit a Free Application for Federal Student Aid (FAFSA) to the Federal Student Aid Programs. Upon receipt of the FAFSA, the processor will analyze the information and send to the student a Student Aid Report (SAR). If the information on the SAR is correct, the student should remit the information to the Office of Financial Aid.

Northeastern University also requires its students to complete an Institutional Application. The Institutional Application will provide your counselor with additional information that is not on the FAFSA.

Federal regulations require that students submit a Financial Aid Transcript (FAT) from each school they have previously attended to the Office of Financial Aid at Northeastern University before they can receive financial aid. This is required even if aid was not received at the other institution(s). If your transcript indicates you are in default on a loan or you owe a refund, you will be ineligible for all types of financial aid until this status is cleared.

All application materials are available at the Office of Financial Aid. Students should begin the application procedure at **least twelve weeks** before the start of the quarter in which they plan to enroll. Students must apply for financial aid each academic year.

In order to be eligible for financial aid, students must be admitted into a degree program prior to the beginning of the academic quarter for which they are interested in receiving financial aid. Students admitted after the start of the quarter will not be eligible for aid until the next academic quarter. Students not yet admitted into a degree program are advised to contact the University College Office of Academic and Student Affairs, 180 Ryder Hall, (617) 373-2400.

Satisfactory Academic Progress

For all students who are receiving financial aid for the first time on or after July 1, 1987, satisfactory academic progress will be determined based on having achieved a 2.0 QPA after the completion of the second grade level and maintaining that minimum until completion of the degree. Students not achieving a 2.0 QPA or dropping below that minimum after their second grade level will not, by Federal law, be eligible for financial aid.

Financial Aid Programs

Financial aid to students is offered in the form of loans and grants. The following programs are available:

• Federal Pell Grants

Based on a student's financial information, a student may be eligible for a Federal Pell Grant. A student with a first bachelor's degree is not eligible for a Federal Pell Grant. Approximately six weeks after a student has filed the FAFSA, the Federal Pell Grant Processor will send the student a Student Aid Report (SAR). If a student is eligible for a Federal Pell Grant, the SAR should be submitted to the Office of Financial Aid.

If eligible for a Federal Pell Grant, the amount of the grant will vary depending upon the number of quarter hours a student is enrolled in for each quarter.

• Federal Stafford Loan Program

The Federal Stafford Loan Program enables a student to borrow a maximum of \$2,625 during the freshman academic year, \$3,500 during the sophomore year, and \$5,500 for subsequent years from a participating bank or other financial institution. The federal government pays the interest while the student is in school. This loan must be repaid. The legal maximum loan limit for undergraduate students is \$23,000.

Eligibility to participate in the Federal Stafford Loan Program is based on need in accordance with federal regulations. Students must be admitted into a degree program and enrolled in at least a half-time (6 quarter hours per quarter) basis in order to be eligible for this loan.

In order to have a loan processed by the Financial Aid Office, a student must have a complete financial aid application on file, have received a letter of eligibility from our office, and have submitted a Federal Stafford Student Loan Application. Applications for the loan are available from local lending institutions and the Office of Financial Aid.

Repayment of the loan usually begins six months after a student withdraws, graduates from an educational institution, or ceases to carry at least a half-time course load. The repayment period may be as long as ten years. The amount of the payments depends upon the size of the debt, but must be at least \$50 per month.

Repayment on loans may be deferred under certain circumstances. For details, contact your lender.

Students who borrow funds through this program must report any of the following changes to their lenders:

- withdrawal from school;
- transfer to another school;
- reduction of course load to less than half time;
- change of address or parents' address; and
- change of name.

Students who do not show financial eligibility for the Federal Stafford Loan may qualify for the **Unsubsidized Stafford Loan**. This loan has the same interest rate, repayment terms, etc., but the student must pay interest while in school or may defer it and the accrued interest will be added to the principal.

Additional information about financial aid is available from the Office of Financial Aid, 356 Richards Hall, 617-373-3190.

All federal financial aid programs are subject to change depending on adequate and continuing federal support.

• State Scholarships

Eligibility for state scholarships is based on need and is determined by the Scholarship Office in each state. If you completed a FAFSA, you will receive a separate letter from your State Scholarship Office notifying you of your eligibility. In order to be eligible for a state scholarship, a student must be admitted into a degree program and enrolled in at least 12 quarter hours per quarter for 2 quarters during the academic year. A student with a prior bachelor's degree is not eligible to receive a state scholarship. Contact your State Scholarship Office for more information.

Scholarships

The following University College and Lowell Institute scholarships and awards are available to students who have been accepted as degree candidates and are in good academic standing.

Scholarships are awarded once a year by the Scholarship Committee. Final selection of scholarship recipients is usually made in early July, followed by award notification in late July or early August. Funds are usually applied to tuition expenses for the following academic year. Awards range in amount from \$500 to \$1,000.

Application Procedure

At the end of January, a mailing list of students who have requested applications is prepared and applications are mailed out with the stipulation that they be completed and returned to the Office of the Dean by March 31. A student can be placed on the January mailing list by calling 617-373-2400 or TTY 617-373-2825 and leaving his or her name, address, and student ID number with the receptionist.

Dean Kenneth W. Ballou Family Scholarship Fund

The Dean Kenneth W. Ballou Family Scholarship Fund was established in 1986 by the generosity of the Kenneth W. Ballou family. Dean Ballou served Northeastern University in various capacities from 1957 to 1978, including as Director of Undergraduate Admissions, Dean of University Relations, Assistant to the President, Dean of Adult Education Programs, and Dean of University College. This scholarship is awarded annually to a University College student(s) who demonstrates financial need, academic promise, and leadership potential.

The Bookbuilders of Boston Scholarship

This scholarship was established in 1982 in memory of Martin B. Sweeney, who taught publishing courses for many years at Northeastern. The funds have been provided by The Bookbuilders of Boston, a professional organization, to support the education of students interested in book publishing. To be eligible for the award, a student must be able to demonstrate interest in publishing as a career, must be taking courses related to publishing and the graphic arts, and must become an active part of the organization.

James A. Buczel Memorial Scholarship

This scholarship was established in 1988 in memory of James A. Buczel, who received his associate in science degree in 1978. The endowment funds were provided by the family, friends, and associates of Mr. Buczel who was a member of the U.S. Customs Service of the Department of the Treasury. He lost his life in the line of duty while inspecting cargoes on Sunday, October 9, 1988 in New Haven, Connecticut. The income from this memorial scholarship fund is to be awarded to undergraduate students in University College who are majoring in Criminal Justice and demonstrate financial need, academic promise, and soundness of character.

Godfrey L. Cabot Scholarship Fund

This fund was established by Dr. Cabot in 1954 to help meet the college expenses of employees or children of employees of Cabot Corporation and its subsidiary and associated companies. The employee must have completed at least five years of service with the company prior to the time the student enters the University. The University shall determine the number and amount of these scholarships, which are not based on scholastic achievement and are available to evening as well as day students. Students interested in applying for scholarship aid from this fund should contact the Cabot personnel office or the Office of Financial Aid at Northeastern University.

Dorothy G. Cooley Scholarship

This scholarship was established in 1988 by Dorothy G. Cooley, a 1960 graduate of the evening division of The School of Business, now University College. The income from this fund is to be awarded to responsible women students who are candidates for a bachelor's degree and who have demonstrated soundness of character and who have above average scholastic ability.

Criminal Justice Alumni Association Scholarship

The Northeastern University Criminal Justice Alumni Association Scholarship is available to both University College bachelor's degree students and day students. A student must have completed at least 75 percent of the degree coursework, have a QPA of 3.0 or better, and complete the application and essay by March 1. Information is available in the Office of Alumni Relations, 346 Richards Hall.

Henry J. Doherty Memorial Scholarship

The Henry J. Doherty Memorial Scholarship Fund was established in 1987 through the generosity of Doris R. Doherty, as a tribute to her late husband, a 1953 graduate of the Evening School of Business and a successful business leader in the field of legal publishing. The income from the scholarship is awarded annually to deserving students with demonstrated financial need who are pursuing part-time evening study and have been accepted as degree candidates.

Charlotte M. and Theodore S. D'Orlando Scholarship Fund

This fund was established in 1991 by Theodore S. D'Orlando, a graduate of the evening School of Business, Class of 1951. Past president of the Alumni Association and member of The National Council, Husky Associates, and The Huntington Society, Mr. D'Orlando earned an MBA from the College of Business Administration in 1957. Income from this fund is used to assist part-time students of average academic record who are enrolled in a University College degree program and are motivated to improve their scholastic standing, show potential to succeed, and whom without financial assistance could not attend Northeastern University.

Electronics Industries Personnel Association Scholarship

This scholarship was established in 1980 through the generosity of the Electronics Industries Personnel Association. The income is awarded annually to one or more students whose studies, to a significant extent, are in the field of human resources management at University College. Recipients shall demonstrate financial need, soundness of character, and academic stability.

Howard W. Evirs, Jr. Scholarship

This scholarship fund was established in 1991 by Howard W. Evirs, Jr., a graduate of the College of Engineering, Class of 1951, and the Graduate School of Business, Class of 1970.

It is Mr. Evirs' desire to provide financial assistance to a single parent, preferably a female, enrolled in any full-time or part-time baccalaureate program of the University who has demonstrable financial need and proven academic excellence. The income from the scholarship fund which is administered by the Financial Aid Office will be awarded annually.

Students should apply to Northeastern University/Office of Financial Aid, 356 Richards Hall, Boston, MA 02115 regarding the above scholarship.

Vincent A. Forte Memorial Scholarship

This scholarship was established in 1985 in memory of Vincent A. Forte, a graduate of Northeastern University. The endowment funds were provided through the generosity of his family, friends, and associates. Forte was an ambitious student pursuing a full-time business career while attending school part-time. He received an associate's degree from Lincoln Institute in 1957, a Bachelor of Business Administration degree in 1958, and a Master of Business Administration degree in 1967. The income from this fund is awarded to undergraduate students in University College who are pursuing a bachelor's degree in business, who demonstrate financial need, and who are maintaining a cumulative quality-point average of 3.0 or better after completing at least 44 quarter hours of credit.

Chester W. Higgins Memorial Scholarship

The Chester W. Higgins Memorial Scholarship was established in 1991 by the generosity of Mrs. Marion Higgins, as a tribute to her late husband. Chester (Chet) Higgins was a senior lecturer in the Business Administration program of University College for almost forty years. He also served as President of the Faculty Society and was instrumental in establishing the Faculty Society Memorial Scholarship program to benefit part-time students. To be eligible for this award a student should be majoring in management in University College and should demonstrate financial need, academic promise and soundness of character.

Nicholas G. and Helen Kakleas Scholarship Fund

This scholarship was established in 1996 through the generous support of Nicholas G. Kakleas, an alumnus of University College and current President/Chair/CEO of CGI Circuits, and his wife, Helen. This award is to provide financial aid through annual awards to worthy and needy students at University College.

Kappa Tau Scholarships

The Kappa Tau Phi Sorority Scholarship Fund annually makes scholarship awards available to women students in the science, business, engineering, and liberal arts programs who rank highest at the end of the upper-middle year. In the event that the chosen student is eligible for an award of greater monetary value, the award is made to the next highest-ranking woman student. To be eligible for this scholarship, the student must be enrolled in a course meeting at least two evenings per week and must be a candidate for a bachelor's degree. In determining the recipient, grades of all courses completed in prior years are considered.

Martin Luther King, Jr. Scholarships

This scholarship fund was established in 1969 in memory of the late Reverend Martin Luther King, Jr. Awards are made, as openings occur, to a limited number of adults from minority groups who would otherwise be unable to continue their education. Stipends can cover tuition expenses not to exceed six quarter hours in any academic quarter (excluding summer quarter). Northeastern University's Office of Financial Aid, located in Richards Hall, administers these scholarships.

Angelina M. Lentini Scholarship

This scholarship was established in 1991 through the generous support of Angelina Lentini, a graduate of Lincoln College, class of 1967, and University College, class of 1969. This award is to be made to an entering freshman female student who has graduated from the Boston Public School system, and has demonstrable financial need. Recipients of this award may reapply in their upper class years for continued support. Interested students should apply to Northeastern University/Office of Financial Aid, 356 Richards Hall, Boston, MA 02115, regarding the above scholarship.

Alan A. and Shirley A. Mackey Scholarship Fund

The Alan A. and Shirley A. Mackey Scholarship Fund was established in 1987 upon the retirement of Alan A. Mackey from Northeastern University. Dean Mackey served Northeastern University in many capacities: as Dean of Administration, University Registrar, Dean of Continuing Education, and as a member of the mathematics faculty of University College. The scholarship fund provides annual scholarship awards to deserving University College students.

William J. McGovern Memorial Scholarship

The William J. McGovern Memorial Scholarship was established in 1978 by an anonymous donor to honor the memory of William J. McGovern. The donor wishes to assist others in realizing their potential through higher education. The income from this scholarship benefits worthy undergraduate students actively pursuing studies in University College or the Lowell Institute. Recipients must have declared a major, demonstrated financial need and academic achievement, and exhibited a high level of professional promise.

Helen (Boris) Melnik Memorial Nursing Scholarship

Helen (Boris) Melnik was one of the 3,236 graduates of the New England Deaconess Hospital's School of Nursing. Though taken ill early on in her own career, it is her family's hope that this scholarship will assist another practicing nurse in advancing in this caring profession. To be eligible for this award, a student should be a currently certified nursing assistant (CNA), licensed practical nurse (LPN) or registered nurse (RN) and demonstrate financial need, academic promise and the desire to continue a career in the nursing profession.

Timothy F. Moran Scholarship Fund

This scholarship fund was established upon the retirement of Dean Timothy F. Moran, Associate Dean at University College and Director of the Law Enforcement programs. During his second career as an educator, Dean Moran, a retired state police officer, was an innovator and leader in the education of law enforcement officers both in New England and throughout the world. His former students, colleagues, and friends made substantial contributions to establish this fund in his honor. This scholarship is awarded annually to students majoring in policing, security or corrections who demonstrate academic excellence and financial need.

James D. Mukjian Memorial Scholarship

This memorial scholarship fund was established in tribute to James D. Mukjian, a 1955 graduate of the School of Business who also received a graduate degree in business in 1964. Mukjian had worked with the U.S. Defense Logistics Agency, with Sylvania and with Raytheon before retiring. He was a Senior Lecturer, teaching Industrial and Business Management for University College for 25 years. He also served as President of the University College Faculty Society of Northeastern.

Eva Needle Memorial Scholarship

The Eva Needle Memorial Scholarship Fund was established in 1965 with the aid of the Norman Knight Charitable Foundation and is maintained through the generosity of the friends of Bob and Ted Needle in memory of their mother. The income from the fund is awarded annually to a deserving student in the accounting program who demonstrates superior academic achievement. The recipient is selected jointly by Ted Needle, a long-standing member of University College's accounting faculty, and the Scholarship Committee.

Harry Olins Memorial Scholarship

The Harry Olins Memorial Scholarship Fund was established as an expression of a belief in University College students and "what they stand for." The fund, presented by Mrs. Olins in recognition of her husband's long service on the business faculty, makes available an annual tuition award to students who, in terms of scholastic achievement, character, and personal need, best typify the spirit of Northeastern University. To be eligible for this award, the student must be a business administration degree candidate and carry a full academic load during the school year.

Nancy Lee Patterson Memorial Scholarship

This fund was established in 1988 by the family and friends of Mrs. Nancy Lee Patterson at the time of her death. Income from the fund is awarded annually to female students, age 35 or over, attending University College, who demonstrate financial need, soundness of character, and academic stability.

Sigma Epsilon Rho Honor Society Scholarship Awards

The Sigma Epsilon Rho Honor Society Scholarship Awards, established in 1974 by the membership of the Society, are awarded annually to undergraduate students of University College and the Lowell Institute. Eligible students must have a cumulative quality-point average of 3.25 or better after completing 75 percent or more of their required studies.

The Stotsky Award

The Stotsky Award was created in 1990 when Dr. Bernard A. Stotsky, after 28 years of dedicated service as a faculty member and Chief Psychiatrist at the Lane Health Center, established a fund at Northeastern University in memory of his parents, George and Bess Stotsky.

A cash prize of \$250 will be presented annually to one or more students who have exhibited an unusual understanding of, and sensitivity to, Jewish history with particular reference to the Holocaust period. Works submitted for consideration may include, but are not limited to, research in the field, special projects, programs or activities designed and implemented to enhance understanding of the Holocaust.

Any student in good standing, currently enrolled in any school, department or program of Northeastern University is eligible to receive the Stotsky Award. Submissions made by March 1st will be eligible for the current year's award.

This award is administered by the Religious Life Office of Northeastern University. Interested students should contact them at (617) 373-2728 for further details. The mailing address is: Religious Life Office, Room 207 Ell Building, Northeastern University, Boston, MA 02115.

H. Patricia Taylor Scholarship Fund

The H. Patricia Taylor Scholarship Fund was established in 1974 by H. Patricia Taylor, a graduate of University College, and her husband, Harry C. Taylor, a graduate of the School of Business. The scholarship expresses their appreciation for financial assistance made available to Mrs. Taylor when she was obtaining her degree and is an attempt to provide similar funds to assist others in realizing their potential through higher education. The income from the fund is awarded annually to a student enrolled in University College or the Lowell Institute who demonstrates financial need and academic stability and who meets certain other conditions of eligibility.

Jeffrey Lewis Tuton Memorial Fund

Established in 1994 in memory of her son Jeffrey Lewis Tuton, a graduate of the Paramedic Technology Program of University College, by Constance Higgins. The fund will provide supplemental financial aid for the purchase of books by full-time students who are enrolled in the certificate or associate degree program in paramedic technology and who have demonstrated financial need.

U.S. Navy Field Training Supervisors Association Memorial Scholarship

A scholarship fund has been established through the generosity of the U.S. Navy Field Training Supervisors Association in commemoration of the Association's deceased members. The scholarship is awarded annually to a deserving student, selected by the Scholarship Committee, who is a management major working toward a bachelor's degree in the evening program at University College.

University College and the Lowell Institute Faculty Society Memorial Scholarship Awards

The Faculty Society of University College and the Lowell Institute offer several awards annually, primarily for excellence in studies, to bachelor's degree candidates in University College and the Lowell Institute who have carried and are currently carrying a minimum of twenty-four quarter hours annually. Applications, available during the winter quarter, must be returned before the spring quarter. These awards are given in commemoration of the Faculty Society's deceased members.

Roberta Macycove Wasserman Memorial Scholarship

This scholarship was established in 1976 through the generosity of family members and friends of Roberta Macycove Wasserman, who, at the time of her death in 1975, was pursuing liberal arts studies within University College. The income from the fund is awarded annually to a deserving female student who is a homemaker with family responsibilities and who is pursuing part-time studies within University College. The recipient shall demonstrate financial need, soundness of character, and academic stability.

Awards

John W. Robbins Prize

The John W. Robbins Prize was established in 1984 under the terms of the will of the late Lena C. Robbins, in memory of her husband, John W. Robbins, an alumnus of Northeastern University. The income from this memorial gift is awarded annually to the outstanding student (Class Marshal) of the graduating class of University College.

Facilities and Resources

Alpha Sigma Lambda National Honor Society

The Northeastern University chapter of Alpha Sigma Lambda National Honor Society was chartered in 1994 as an honor society for students in continuing adult education. It strives to provide a stimulating impetus to highly motivated students in adult higher education early in their academic careers. Alpha Sigma Lambda recognizes the special achievements of adults who accomplish academic excellence while facing competing interests of home and work. Membership in Alpha Sigma Lambda Honor Society is by invitation to those students matriculated in the associate or baccalaureate degree programs and who meet the established criteria set forth in the chapter's by-laws. For more information, please contact the Office of the Dean, University College, 617-373-2412.

Sport, Dance, and Exercise Facilities

Through its Cabot Center for Physical Education, Dockser Hall and Barletta Natatorium, Northeastern University offers a wide variety of specialized facilities. The Matthews Arena, with seating for more than 5,000 fans, provides home ice to the University's hockey teams and home court for the University's men's basketball teams. These facilities are available to currently enrolled University College students who show a part-time student ID and a photo ID.

Social and Professional Clubs

We welcome and encourage part-time students in University College and the Lowell Institute to join in most of the social and professional activities that are organized and run by the student body, with the assistance of the Student Activities Office (255 Ell Center). Call 617-373-2642 or TTY 617-373-4747 for more information.

Sigma Epsilon Rho Honor Society

Sigma Epsilon Rho is the University College honor society. It aims to promote fellowship among those students who have attained highest scholastic standing in the College; to stimulate the student body to higher scholastic accomplishment through the bearing, influence, and work of these selected men and women; to develop methods of mutual improvement and advancement among members; and to support high moral, professional, and scholastic ideals. Only honor graduates are eligible for admission to the Society. Admission is by invitation after nomination by the Society.

Ell Student Center

The Carl S. Ell Student Center provides facilities for student recreation and extracurricular activities. The Eugene J. Blackman Auditorium, with a seating capacity of 1300, is attached to the Center. Also included are special drama facilities, a ballroom, student offices, conference rooms, an indoor quad, a food court with seating for more than 1,000, an information booth, a copy center, a gameroom, a video arcade, rental computers and typewriters, television viewing areas, movie screenings, and a travel agency. The bookstore is adjacent to the Center.

Lane Health Center

A comprehensive program of medical care is provided to all full-time graduate and undergraduate students and part-time undergraduate students enrolled in 9 q.h. or more. The University maintains a Health Services Clinic which is open for emergencies at all times and is equipped to deal promptly with any medical condition that may arise.

Alumni Association

Upon graduation, you will join the more than 120,000 alumni united within the Alumni Association, which was established to promote a mutually rewarding relationship between Northeastern and its graduates. Association activities include the Homecoming celebration, presentation of the Outstanding Alumni Awards, and the annual presentation of Professional Promise Awards to outstanding seniors. The Association has regional clubs across the country.

About Northeastern University

Profile of the University

At Northeastern University, we value part-time day and evening students as highly as we do our full-time students. You are important members of the academic community and reflect the changing profile of today's college student, which encompasses new concerns for lifespan learning and professional retraining. Northeastern supports your pursuit of personal and professional goals and wants to contribute to your success. You may join all our students in taking full advantage of the academic resources and facilities we offer. In return, you contribute to the intellectual and cultural diversity upon which this urban institution thrives.

Founded in 1898, Northeastern University is incorporated as a privately endowed, nonsectarian institution. From its beginning, the University's mission has been to identify and address the educational needs of a diverse community and student body in distinctive and useful ways. Northeastern did not duplicate the programs of other institutions, but instead became a world leader in new areas of educational service. In particular, the University is known for its Cooperative Plan of Education, under which students alternate periods of work and study. All of Northeastern's undergraduate day colleges operate on the Cooperative Plan, and several of the University's graduate schools have structured their programs to include features of cooperative education. Today, the University is comprised of eight undergraduate colleges and nine graduate schools.

Our undergraduate colleges are

- Bouvé College of Pharmacy and Health Sciences
- College of Arts and Sciences, including the School of Journalism
- College of Business Administration
- College of Computer Science
- College of Criminal Justice
- College of Engineering, including the Lowell Institute, School of Engineering Technology
- College of Nursing
- University College

Our graduate schools are

- Graduate School of Arts and Sciences
- Bouvé College of Pharmacy and Health Sciences Graduate School
- Graduate School of Business Administration
- Graduate School of Computer Science
- Graduate School of Criminal Justice
- Graduate School of Engineering
- Graduate School of Nursing
- Graduate School of Professional Accounting
- School of Law

At Northeastern University, we respond to the needs of people who already hold jobs or are launched in careers, but who wish to advance or change their professional lives as well as pursue personal interests. The University offers a variety of educational options—both credit and noncredit—to suit your particular objectives. University College offers part-time courses leading to certificates and to associate's and bachelor's degrees. The Lowell Institute offers part-time evening and weekend associate's and bachelor's degree programs in technological areas, in addition to daytime undergraduate programs.

All formal courses of study leading to degrees through part-time programs are approved by the full-time day faculty of the Northeastern Basic Colleges and are governed by the same qualitative and quantitative standards.

University Libraries

Together, the collections, services, staff, and facilities of the Northeastern University Libraries provide access to information and an understanding of the organization of the literature and other information resources of the academic disciplines. The library is integral to the academic and research processes, whether these occur in a formal classroom, seminar, or laboratory setting or through individual study and enrichment.

All part-time students have full access to all units of the University Libraries located on the Boston and Burlington campuses and at the Marine Science Center in Nahant.

Total holdings of the University Libraries include more than 835,000 volumes, 1,950,000 microforms, current subscriptions to over 8,900 serials and newspapers, 250,000 government documents, and 17,500 audio, video, and computer software titles.

Snell Library, a centralized library for the Boston campus, is open more than 100 hours each week that classes are in session. It has 2,800 seats on five levels and shelving for more than 1.25 million volumes. Library services incorporate online, telecommunication, and media technologies that are associated with information resources and networks, including an online catalog and circulation system, microcomputer and language laboratories, specialized equipment for users with disabilities, a media center, and a CD-ROM optical disc network. The Library is connected to NUnet, the University's computing network. Students can access NULIS (Northeastern University Libraries Information System) from outside the Library via the network. Students can also utilize many NUnet software applications from microcomputer labs in the Library.

The Burlington Campus Library's collection serves courses taught at that campus. The online catalog as well as CD-ROM databases are available, and materials from the Snell Library collections can be requested at and delivered to Burlington.

Library staff are available in all service areas to assist students, including students with disabilities. Librarians provide instruction to groups and to individuals on the bibliographic research process and on strategies for identifying, locating, and using information resources. Each term, a series of tutorials is offered giving students further opportunities to meet with a librarian to discuss particular or specialized research needs.

Northeastern University is a member of the Boston Library Consortium, a cooperative arrangement among the following academic and research institutions: Boston College, Boston Public Library, Boston University, Brandeis University, Brown University, Marine Biological Laboratory/Woods Hole Oceanographic Institution, Massachusetts Institute of Technology, Northeastern University, State Library of Massachusetts, Tufts University, University of Massachusetts (Amherst, Boston, Dartmouth, Lowell, and Worcester campuses), and Wellesley College. The University's membership in the Boston Library Consortium generally allows for on-site use by, but does not grant borrowing privileges to, Northeastern students. To apply for a Consortium card, please inquire at the Circulation Desk. Some libraries in the Boston area require that a visiting student present a special pass or letter of introduction; a Northeastern reference librarian can advise about such student visitor policies.

Division of Academic Computing

DAC is responsible for providing students, faculty and staff with reliable access to Northeastern's academic, technical and information resources including NUnet (the campus-wide network), lynx (Northeastern's mail, news and internet access computer), the VAXcluster (the University research mainframe) and public access computer labs. *Lynx*, the VAXcluster, the Snell Library computer system and selected other University systems are available via modem dial-in facilities. Contact the Help Desk at 617-373-4224 for specific details.

Lynx accounts are available free of charge to all University faculty, staff and students; one must present a valid Northeastern ID in the DAC main office. At Northeastern, computing is a privilege rather than a right. Violations of the provisions of the DAC Acceptable Use statement may result in the loss of that privilege. The statement is available in the DAC main office.

The Help Desk supports walk-in requests for information and assistance. The staff provides basic level support for a variety of software applications, as well as services like dial-in, downloading, virus scanning and removal and document scanning. In addition, a software manual library is located at the Help Desk. The Help Desk staff (and the computer lab staff) can help you use the computing resources but they are not tutors or instructors. They cannot help you interpret handouts or assignments, teach computer related subjects, or debug programs.

Not all academic computing facilities at Northeastern are maintained by DAC; several colleges and departments have their own facilities. If you are a student in the College of Computer Science, the College of Engineering or the College of Business, you may want to investigate its resources.

Research

Research and scholarship are integral parts of Northeastern University's commitment to the intellectual growth and academic achievement of its students. Research activities span almost every academic field and include laboratory projects, theoretical studies, and technological applications.

Funding for research comes from government agencies, foundations, corporations, and the University itself. In recent years, such industrial firms as Beckman, General Electric, Digital, and Lockheed have supported Northeastern's research programs. Currently, external grants and contracts exceed \$27.5 million annually.

Northeastern's faculty numbers among its ranks some of the most distinguished scholars in their fields, and many have received such prestigious awards as Sloan Scholarships, Guggenheim Fellowships, National Institutes of Health Research Awards, Fulbright Scholarships, and a MacArthur Foundation grant. Faculty members lecture the world over, serve as consultants to industry and government agencies, participate on a variety of national and international committees, and are quoted frequently in the regional and national press on a wide range of subjects.

Programs at Northeastern

Undergraduate Colleges

Bouvé College of Pharmacy and Health Sciences

Offers five-year, cooperative education programs leading to the bachelor of science in Pharmacy, Respiratory Therapy, Toxicology, Physical Therapy, and to the bachelor of science with majors in medical laboratory science, cardiopulmonary sciences, and athletic training. A non-cooperative four-year baccalaureate program is offered in dental hygiene. Associate's degree programs are offered in medical laboratory science and dental hygiene. The College also offers post-baccalaureate certificate programs for physician assistants (the PA option is a 2-year program with the option of a Master of Health Professions), respiratory therapy, cardiovascular technology, and medical laboratory science (concentrations in blood banking, clinical chemistry, hematology, immunology, and microbiology). For information, call 617-373-3320.

College of Arts and Sciences

Offers programs in the visual and performing arts, humanities, journalism, social sciences, physical and natural sciences, and mathematics leading to the bachelor of arts or bachelor of science degrees. Programs are normally four years in length on a full-time plan or five years in length on the cooperative education plan. For more information, call 617-373-2200.

College of Business Administration

Offers four- and five-year, cooperative education programs leading to the bachelor of science in Business Administration (BSBA) and the bachelor of science in International Business (BSIB). Students in both programs complete a concentration in accounting, human resources management, marketing, finance and insurance, management, entrepreneurship and small business management, management information systems or logistics and transportation. In addition, students in the BSBA program may concentrate in international business. For more information, call 617-373-2200.

College of Computer Science

Offers a five-year and a four-year cooperative education program leading to the bachelor of arts in Computer Science, and the bachelor of science in Computer Science, with emphasis tracks in database management, languages, and operating systems. Other electives include parallel processing, graphics, distributed computing, and artificial intelligence. Research opportunities are available to advanced students. For more information, call 617-373-2462.

College of Criminal Justice

Offers a five-year, cooperative education program leading to the bachelor of science degree. For more information, call 617-373-3327.

College of Engineering

Offers four- and five-year cooperative education programs in chemical, civil, electrical (including a power systems option and a computer engineering option), industrial, and mechanical engineering leading to the bachelor of science with specification according to the department. The College also offers a six-year, accredited, part-time evening program leading to the bachelor of science degree in civil, electrical, or mechanical engineering. For more information about the part-time programs, call 617-373-2185. These programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. A more general program leading to the bachelor of science without specification is also offered. For highly qualified students, the electrical and computer engineering, and the mechanical, industrial and manufacturing engineering departments offer five-year programs leading to the bachelor's and the master's degrees; students generally carry five courses per quarter and forego one cooperative work quarter to complete the program.

The Lowell Institute School

The Lowell Institute School at Northeastern, a division of the School of Engineering Technology, offers programs leading to the associate in Engineering, associate in science, and bachelor of science in Engineering Technology on both a full-time and part-time basis. A full-time, five-year cooperative education plan is offered, at the baccalaureate level, in electrical and mechanical engineering technology and computer technology. A full-time, three-year cooperative education plan is offered, at the baccalaureate level, for transfer students in Aerospace-Maintenance Engineering Technology. In addition, part-time evening and weekend programs are available at the associate level in Computer Technology, Telecommunications, and Electrical, Environmental, Mechanical, Mechanical with a concentration in manufacturing, Structural, and Surveying and Highway Engineering Technology. Part-time evening and weekend programs are available at the baccalaureate level in Computer Technology, Electrical, and Mechanical Engineering Technology. A part-time baccalaureate degree is also available, for transfer students, in Aerospace-Maintenance Engineering Technology. The C++/UNIX Specialist, Computer Technology, Electronics Technology and Engineering Drawing certificates are available on a part-time basis as well. Many of the part-time and weekend technology courses are televised via Network Northeastern to satellite campuses and company sites. For more information, call 617-373-2500.

College of Nursing

The College of Nursing offers a five-year, cooperative education program leading to the Bachelor of Science in Nursing. The College welcomes transfer students who have a degree in another field or who have completed a minimum of 45 quarter hours of credit (including *Anatomy and Physiology 1 and 2*) to enter a 3 year accelerated transfer track program. The College offers an R.N. to B.S.N. option for registered nurses who wish to pursue a baccalaureate degree in nursing. The R.N. to B.S.N. option is offered in collaboration with Northeastern University's part-time unit, University College. Call 617-373-5796. The College of Nursing offers a R.N. to M.S. Program leading to both bachelor's and master's degrees for qualifying experienced registered nurses. For more information, call 617-373-3590 or 617-373-3125 (voice mail).

Graduate Schools

Bouvé College of Pharmacy and Health Sciences

Offers programs leading to the Master of Science degree in general biomedical science, hospital pharmacy, medical laboratory science, medicinal chemistry, pharmacology, toxicology, clinical exercise physiology, counseling psychology, rehabilitation counseling, speech-language pathology and audiology, human resource counseling, applied behavior analysis, college student development and counseling, applied educational psychology with specialties in school counseling and school psychology. The Master of Health Professions is offered with four options: general, health policy, physician assistant, and regulatory toxicology. The Certificate of Advanced Graduate Study may be earned in counseling psychology, rehabilitation counseling, school psychology, or human services specialist. A *Doctor of Philosophy degree* is offered in biomedical science with specializations in medical laboratory science, medicinal chemistry, pharmaceuticals, pharmacology, or toxicology. A graduate program in clinical pharmacy, leading to the Doctor of Pharmacy, is also available. The Doctor of Philosophy degree is offered in counseling psychology and school psychology. For more information, call 617-373-3380.

College of Arts and Sciences

Offers programs leading to the master of arts degree in economics, English, history, journalism, political science, sociology, social anthropology, and writing. The master of science degree is available in biology; chemistry; economic policy and planning; law, policy, and society; mathematics; and physics. The Master of Technical and Professional Writing, the Master of Public Administration, and the Master of Education degrees are also offered. The Master of Arts in Teaching degree is available in biology, chemistry, English, history and mathematics. The Master of Science in Operations Research is offered through the departments of Mathematics and Mechanical, Industrial, and Manufacturing Engineering. In addition, there are programs leading to the Doctor of Philosophy degree in biology; chemistry; English; history; law, policy, and society; mathematics; physics; psychology; and sociology. Non-degree certification programs are offered in elementary, middle, and secondary education. There is also a non-degree certificate program in technical writing. Most programs may be completed through either full- or part-time study. For more information, call 617-373-3982 to be referred to the department of interest.

College of Business Administration

The Graduate School of Business Administration offers five programs leading to the Master of Business Administration (MBA) degree. Options include the Cooperative Education MBA program, the Full-Time MBA program, and the Part-Time MBA program. Selected courses are offered at the University's downtown campus at Batterymarch. An Executive MBA program tailored to the needs of experienced managers and a High-Technology MBA designed for professionals in the high technology community are offered at suburban campuses. A specialized degree program leading to a Master of Science in Finance is offered at both Batterymarch and the University's main campus in Boston. Additionally, a post-MBA leading to the Certificate of Advanced Study is available. For more information, call 617-373-2714.

The Graduate School of Professional Accounting offers a unique fifteen month comprehensive MS/MBA degree program specifically designed for the liberal arts and sciences graduate. The program features a three-month paid internship with a major CPA firm and achieves virtually 100% placement for its students upon graduation.

The GSPA also offers a Master of Science in Taxation Program (MST) on a part-time basis for those already qualified in the accounting or business fields seeking to become tax or personal financial planning specialists. It is a small, selective program regarded as the qualitative leader in tax education. The MST program is offered on the main campus in Boston and in the heart of the financial district at Batterymarch. Information on all GSPA programs can be obtained by calling 617-373-3244.

The Office of Executive Education offers executive-level management programs custom-designed to meet the specific needs of individual companies. Program faculty and administrative staff work together with key company executives to develop programs designed to utilize major current challenges as learning opportunities. Two types of programs are offered. In one, the emphasis is on programs designed to help experienced managers improve their immediate effectiveness. In the other, emphasis is on preparing executives for promotion and reassignment. For more information, call 617-373-3272.

College of Computer Science

Offers full-time and part-time programs leading to the Master of Science in Computer Science with concentrations in artificial intelligence, communications and networks, databases, operating systems, programming languages, graphics and image processing, and theory. The Doctor of Philosophy program includes theory, artificial intelligence, data-base management, parallel distributed computing, programming languages, and systems. For more information, call 617-373-2464.

College of Criminal Justice

Offers both full-time and part-time study leading to the Master of Science in Criminal Justice. A full-time program normally takes one full year for completion. While students are encouraged to tailor their program to meet their own educational and career objectives, the curriculum offers specialization in Justice Administration, Criminology, Juvenile Justice, Security Administration, and Research. For more information, call 617-373-3327.

College of Engineering

Offers full-time and part-time programs leading to the Master of Science in chemical engineering, civil engineering, computer systems engineering (CAD/CAM, engineering software design and robotics), electrical engineering, engineering management, industrial engineering, information systems, and mechanical engineering. An interdisciplinary master's program in operations research is also offered. The engineer degree is available in electrical, industrial, and mechanical engineering. A five-year program leading to both a Bachelor and a Master of Science degree is offered in electrical, industrial, and mechanical engineering. The Doctor of Philosophy degree is offered in chemical engineering, civil engineering, electrical engineering, industrial engineering and mechanical engineering. An interdisciplinary Doctor of Philosophy is available for graduate students whose interests overlap two or more departments. Women in Engineering and Women in Information Systems programs are also available. For more information call 617-373-2711.

College of Nursing

Offers a full-time and part-time Master of Science Degree in Nursing program. The master of science degree may be earned with a specialization in Critical Care (with neonatal and acute care practitioner options), Administration, Anesthesia (offered with New England Medical Center), Community Health (with a home health practitioner option), Primary Care (nurse practitioner) and Psychiatric-Mental Health Nursing. An RN-MS Program leading to a joint BSN/MS degree is available to registered nurses with

a nursing diploma or associate's degree who have at least five years of experience. Also offered is a CRNA to MS program for Certified Registered Nurse Anesthetists in good standing with at least one year of professional practice after certification. A Certificate of Advanced Study program is available in all specializations except Anesthesia for nurses who hold a Master of Science degree in Nursing.

For more information about any of these programs, call 617-373-3590 or 617-373-3125 (voice mail).

School of Law

Offers a full-time day program leading to the juris doctor degree. The three-year curriculum includes four quarters of work experience in various legal settings including judges' chambers, law firms and governmental agencies. Five clinics are offered: Domestic Violence, Criminal Advocacy, Poverty Law and Practice, Prisoners' Rights and Certiorari/Criminal Appeals. In addition, the university's Urban Law and Public Policy Institute, which addresses urban problems through a think tank and community information clearinghouse, was established at the law school in 1994. Concurrent degree programs for the M.B.A., M.S. in accounting and Ph.D. in Law, Policy and Society are available. For more information, call 617-373-2395.

Center for Continuing Education

Northeastern University established continuing education programs over thirty years ago to provide a practical, high quality career-related education in business and industry consistent with the University's tradition of adult education. The mission of the center is to be a leader in nondegreed continuing education for the career professional. Courses are taught primarily by practitioners in their respective fields. Program development, courses, and seminars are based on market needs and wants and are offered at convenient off-campus locations and at company sites. The center continues to enhance Northeastern University's regional and national reputation as a leader in continuing education via such technological advances as microwave and satellite transmission. For further information on the programs, telephone the center office at 617-373-5828 or visit the web site: <http://www.neu.edu/cont-ed>.

On-Site Training

Through its Corporate Training Group, Northeastern University offers non-credit and credit courses in a variety of subject areas to help you grow your business. More than 50 certificate programs are offered in diverse subject areas and Northeastern can customize a training program to fit your unique requirements. To discuss your training needs, call John Robidoux, 617-320-8051, or Kathleen Manning, 617-320-8057, or fax 617-320-8029.

Northeastern University Center for Family Business

Northeastern University's Center for Family Business is a membership based program offering seminars and highly interactive round table workshops to family owned businesses. Programs focus on a variety of topics from leadership succession and ownership transfer to conflict resolution around issues of power, control, and money. Constituent groups, such as a Leadership Development Forum for younger generation members as well as a Seniors' and Women's Forum, complement the core program. Continuing education is also offered to a limited number of prospective members on a select basis. For further information, telephone Paul Karofsky at 617-320-8015 or e-mail at pkarofsky@lynx.neu.edu.

State-of-the-Art Program

The State-of-the-Art Program offers evening, day, and Saturday courses, seminars, and on-site training designed for working professionals seeking practical, hands-on education in a work-related area of technology. The curriculum includes high-level computer courses in software engineering, networking and communications, and microelectronics and computer technology. Certificates offered include UNIX, object-oriented programming, client/server technology, software engineering using C, data communications system technology and system management, telecommunications system technology, local area networking, and microelectronics/system technology. For further information, telephone the State-of-the-Art Program at 617-320-8052.

Building Design and Management and FE/PE Program

Designed for a broad spectrum of professionals, the Building Design and Management Program offers evening courses, on-site training, and certificates of Professional Achievement in such topics as architecture, facilities management, real estate inspections, landscape management, construction management, fire protection systems, HVAC, surveying, construction law, plumbing/electrical, and FE and PE license examination preparation. For further information, telephone 617-320-8026.

Environmental and Regulatory Management Program

This program covers the essentials of regulation, evaluation, assessment, and management techniques relevant to today's environmental and occupational health and safety industries. Evening courses, custom on-site corporate training, and seminars leading to Certificates of Professional Achievement are offered in compliance management; solid and hazardous waste management; occupational health and safety; and site investigation and remediation. For further information, telephone 617-320-8026.

Paralegal Professional Program

The Paralegal Certificate Program offers an intensive 12-week program designed to give participants hands-on practical paralegal training in the areas of litigation, real estate, research, probate, and corporations. Classes are taught by an attorney/paralegal team who practice in that legal specialty. Also offered are continuing education courses for practicing paralegals on current and relevant topics. For further information, telephone 617-320-8024.

Insurance and Financial Services Institute

Established to foster excellence in the insurance and financial services communities in the Boston area, the institute offers courses and seminars in general insurance, risk management, insurance licensing, securities registration, and financial planning. These study programs assist those seeking to develop or to update professional credentials. For further information, telephone 617-320-8021.

Network Northeastern

Network Northeastern is the instructional television system of Northeastern University that was created in 1983 to broadcast live credit and non-credit courses to Boston area corporate sites via its four microwave channels. Beginning in 1987, Network Northeastern has been offering instruction nationwide on a Ku-band satellite uplink via the National Technological University (NTU) satellite system, a consortium of 46 US universities. In addition to its broadcast programs, Network Northeastern provides production facilities for videotaping courses, lectures, and short programs to the University community.

For its local industry students, Network Northeastern broadcasts a complete master's degree program in electrical and computer engineering, a variety of graduate courses in computer science, mechanical and industrial engineering and an extensive selection of undergraduate courses and non-credit seminars. On-site advising, registration by fax or telephone and information sessions are some of the services provided by the Network Northeastern staff to its corporate clients.

Companies currently subscribing include: AEG Schneider Automation (North Andover), Analog Devices, Inc. (Wilmington), Andover Control (Andover), Alpha Industries (Woburn), AGFA Compugraphic (Wilmington), Bolt, Beranek and Newman (Cambridge), Computervision Corporation (Bedford), Digital Equipment Corporation (Hudson, Littleton, Shrewsbury), Charles Stark Draper Labs (Cambridge), Dynamics Research Corporation (Andover), Eastman-Gelatin Corporation (Peabody), EPSILON (Burlington), GTE (Needham), Hanscom AFB (Bedford), Houghton-Mifflin (Boston), LTX (Westwood), M/A-COM (Lowell), Mass. Dept. of Revenue (Boston), MIT Lincoln Lab (Lexington), MITRE Corporation (Bedford), Northrop Corporation (Norwood), Polaroid Corporation (Cambridge, Waltham), Quantum (Shrewsbury), Raytheon Company (Bedford, Sudbury, Tewksbury, Marlboro), Textron Defense Systems (Wilmington), Ungerman-Bass, Inc. (Andover), Unisys Corp. (Cambridge), and Woods Hole Oceanographic Inst. (Woods Hole).

If you currently work at one of our receive sites and would like to find out who to speak to at your company or if you would like to learn how your company can subscribe, please call 617-373-5620.

Faculty

*Denotes senior lecturer as of October 1995.

Kimiko Abramoff, M.A.

Modern Language

Hon. Herbert Abrams, M.L.*

Criminal Justice and Security

Superior Court of Massachusetts

Michael J. Abruzzese, M.B.A.*

Information Systems

Primerica Financial Services

Nagy Accad, B.S.

Health Science

VA Medical Center

Deborah A. Adair, M.S., RRA*

Health Information

Administration

Elliott Hospital

Stephen D. Adair, Ph.D.*

Sociology/Anthropology

University of New Hampshire

John Adams, Ph.D.

Economics

Northeastern University

Thomas J. Ahern, Jr., J.D.*

Business Law

Silver and Ahern

Joseph Aieta III, M.A.*

History

Lasell College

Peter J. Al-Achi, M.S.

Biology

Northeastern University

Edward E. Alessi, M.A.*

Sociology/Anthropology

Alan Alford, M.B.A.

Finance

Northeastern University

Fabria Aliloo, M.S.

Information Systems

New Media Services

Patricia L. Alves, M.B.A.

Hotel & Restaurant Management

Katharine Gibbs

Susan A. Alves, M.A.

English

Northeastern University

Rae Andre, Ph.D.

Human Resources Management

Northeastern University

Robert B. Angus, M.S.*

Mathematics

Angus Associates

Stanley S. Antonioti, M.A.*

Economics

Bridgewater State College

Robert J. Anzenberger,

M.P.A.*

Human Resources Management

Joseph T. Arcidiacono, B.S.*

Information Systems

Ledgendary Sports

Stephen F. Armstrong, Sr.,

Ed.D.*

Purchasing

Varian Associates

Gilbert N. Aronson, M.Ed.*

Technical Communications

Bolt Beranek and Newman, Inc.

Sally Arsenault, A.S.

Radiologic Technology

University Hospital

Roger M. Atherton, Ph.D.

Management

Northeastern University

Lynda F. Atkins, M.B.A.

Management

Meredith O. Atkinson, M.A.*

English

Ursuline Academy

Marjorie J. Atlas, M.A.

Music

Northeastern University

Saul H. Auslander, M.B.A.*

Finance

Bridgewater State College

Joseph Autilio, J.D.

Political Science

Board of Real Estate Brokers

John Avakian, M.F.A.

Art

P.C. Week

Warren F. Averill, M.S.*

Chemistry

Co-Valence Corp.

Ralph R. Avery, M.S.

Policing

Wheaton College

Robert J. Awkward, M.S.

Human Resources Management

ABT Associates, Inc.

James A. Baar, A.B.

Journalism

Omegacom

David L. Bachrach, Ed.D.*

Psychology

Boston VA Medical Center

Deborah J. Baiano, M.A.

Alternative Freshman/Sociology

Carole Bailey, B.S.

Marketing

Anthony J. Bajdek, M.A.*

History

Northeastern University

Charles D. Baker, M.B.A.

Management

Northeastern University

Edward F. Baker, M.S.*

Mathematics

Westwood High School

Errol H. Baker, Ph.D.*

Psychology

Boston VA Medical Center

Sara K. Baker, M.S.*

Art

Baker Design

Ramaiya Balachandra, Ph.D.

Management Sciences

Northeastern University

Peter S. Baleta, M.S.*

Biology

Lynn Public School System

George B. Ballester, M.A.

Information Systems

Mellon Trust

Louis E. Banderet, Ph.D.*

Psychology

U.S. Army Research Institute

Brendan Bannister, D.B.A.

Human Resources Management

Northeastern University

John J. Baranofsky, M.S.*

Management

Biocybernetics Laboratories, Inc.

David R. Barkmeier, Ph.D.*

Psychology

Raymond S. Barnstone, M.B.A.*

Finance

Cambridge Management Associates

Donna M. Barnes, M.A.

Sociology/Anthropology

Northeastern University

Cynthia L. Baron, M.B.A.

Art

Northeastern University

Martin J. Barrett, J.D.

Human Resources Management

University of Massachusetts

Medical Center

Pam M. Basile, B.S.

Hotel and Restaurant

Management

Westin Hotel

Anne Bateman, Ed.D.

Nursing

Northeastern University

William W. Bauser, M.A.*

Philosophy/Religion

Dean Junior College

Mark H. Beaudry, M.S.

Security

Westin Hotel

Stanley A. Beecoff, M.B.A.*

Management

Self-employed

Roger Beer, M.S.*

Information Systems

Digital Equipment Corp.

Thomas M. Begley, Ph.D.

Human Resources Management

Richard E. Belanger, B.S.*

Management

Digital Equipment Corporation

Susan B. Belinsky, M.P.A.

Health Management

Laboure College

Ralph C. Belmonte, Ed.D.*

Communication Studies

Edward Bembery, M.Ed.

Alternative Freshman/Language Skills

Patricia Bench, M.Ed.

Alternative Freshman/Mathematics

Richard F. Benedetto, M.A.*

Alternative Freshman/Management

Self-employed

Moshe Ben-Horim, Ph.D.

Finance

Northeastern University

Eugene Bernstein, Ph.D.

Biology

Boston University School of

Medicine

Samuel J. Bernstein, Ph.D.*

English

Northeastern University

Craig Bettinson, M.Ed.

Career Development

Northeastern University

Alfred J. Bevington, B.S.

Marketing

BULL HN Information Systems

Gaurab Bhardwaj, B.S.

Management Sciences

Henry M. J. Biagi, M.A.*

Hotel & Restaurant Management

City of Somerville

Deborah Bisson, B.S.

Health Science

Brigham and Women's

Christopher Blackburn, Ph.D.

Chemistry

Covalent Associates

Charmarie J. Blaisdell, Ph.D.*

History

Northeastern University

Robert J. Blanch, Ph.D.*

English

Northeastern University

Theodore Blank, Ed.D.*

Health Science

Michael L. Blim, Ph.D.

Sociology/Anthropology

Northeastern University

Lawrence J. Blumsack, M.S.

Theatre

Presentations, Inc.

Janet L. Bobcean, M.F.A.

Theatre

Northeastern University

Stephen M. Boczanowski, M.S.

Art

Marshfield High School

Paul J. Bolster, Ph.D.

Finance

Northeastern University

Jay Borkland, M.A.

Earth Science

Goldbergzoino & Associates

Jeffrey Born, Ph.D.

Finance

Northeastern University

David Boston, M.Ed.

Earth Science

Wellesley High School

Charles R. Botticelli, Ph.D.*

Biology/Health Science

Guy E. Bottiglio, M.S.*

Information Systems

Interactive Business Systems

Jean Paul Boucher, M.A.

Human Resources Management

Liberty Mutual

Annamarie Boudreau, M.Ed.

Education

Charlestown High School

Eric G. Bourgeois, M.A.

Sociology/Anthropology

Alma Bournazian, M.S.

American Sign Language

John F. Bowes, Jr., M.B.A.*

Information Systems

MBTA

Elizabeth Powers Bowling, M.A.
Information Systems
 Lotus Development Corp.
 David Boyd, Ph.D.
Human Resources Management
 Northeastern University
 Robert T. Boyd, M.S.
Mathematics
 Town of Winchester
 Richard W. Boyden, B.S.*
Information Systems
 Self-Employed
 Donald J. Boyle, M.B.A.
Marketing
 Patricia A. Branz, B.S.
American Sign Language
 Barbara Breen, C.P.A.
Accounting
 Univision Technologies, Inc.
 Nancy Marlo Brehio, B.S.
Biology
 Northeastern University
 Steven Brehio, M.S.
Health Science
 Northeastern University
 Linda Brierley, M.B.A.
Health Management
 Richard Briotta, M.S.
Information Systems
 Northeastern University
 William A. Brittingham, M.A.
Sociology/Anthropology
 George M. Brooker, M.B.A.*
Economics
 Dean Junior College
 Fern M. Brown, M.Ed.
English
 VOICES
 Judith B. Brown, M.F.A.
Art
 Montserrat College of Art
 Jeffrey Brubaker, M.A.
Biology
 Dana Farber
 Deborah Bruce, A.S.
Radiologic Technology
 University Hospital
 Eric Bruner, M.A.
Earth Science
 Adventures in Learning
 Richard P. Bucci, M.B.A.*
Accounting
 Self-employed
 Debra F. Buckley, M.B.A.
Management
 HCHP
 Gayle H. Buff, M.B.A.
Finance
 GB Financial Counseling
 Anthony A. Buglio, M.S.*
Communication Studies
 The Speech Consultancy
 Kenneth R. Buja, B.S.*
Transportation
 Customized Trans., Inc.
 Bruce Bunten, B.S.*
Human Resources Management
 Human Resource Services
 Joan Burke, M.S.
Nursing
 Visiting Nurse and Community
 Health

Robert K. Burke, M.B.A.*
Information Systems
 State Street Bank
 Mary-Jane Burke-Robinson,
 M.B.A.
Finance
 State Street Boston Corporation
 L. Gerald Bursley, Ph.D.
Political Science
 Northeastern University
 Harvey Burstein, J.D.
Criminal Justice and Security
 Northeastern University
 Karen Buzzard, Ph.D.*
Communication Studies
 Northeastern University
 Glen Cabbage, M.P.A.
Computer Literacy
 WT Chem & Co., Inc.
 Charles Calusdian, M.B.A.*
Industrial Management
 Self-employed
 David S. Calverley, Ph.D.*
Psychology
 Ballard C. Campbell, Ph.D.*
History
 Northeastern University
 Cathleen Campbell, L.L.B.
Criminal Justice
 Suffolk County Sheriffs Department
 Walter D. Campbell, M.B.A.
Purchasing
 Cole Hersee Company
 Walter R. Campbell, M.B.A.
Accounting
 Aleta F. Cane, M.A.
English
 Northeastern University
 Lisa M. Cantwell, M.A.
English
 Northeastern University
 Monica Cantwell, M.A.
Sociology/Anthropology
 Ingrid Capozzoli, M.F.A.
Art
 Independent Artist
 Margo R. Capparelli, M.A.
Alternative Freshman/Sociology
 Brian R. Caputo, M.B.A.
Management Sciences
 GTE
 Donald A. Carbone, M.Ed.*
Accounting
 Massachusetts Department of
 Education
 David A. Carlson, M.A.T.
Criminal Justice
 Janet H. Carr, M.A.*
English
 Northeastern University
 William F. Carr, LL.B.*
Business Law
 Puopolo & Carr, P.C.
 William Carroll, J.D.
Health Management
 Self-employed
 Paula C. Caruso, Ph.D.
Alternative Freshman/Language Skills
 Robert W. Casey, M.Ed.*
Communication Studies
 Burlington High School
 Margaret P. Casper, Ph.D.*
Mathematics
 King Philip Regional Schools

Christopher L. Cass, M.A.*
Sociology/Anthropology
 Badger Engineers, Inc.
 Edward C. Cass, Ph.D.
History
 Northeast Consultants
 Sharron G. Cassavant, Ph.D.*
English
 MacSyma, Inc.
 Christopher J. Cassidy, M.S.*
Information Systems
 Northeastern University
 Vincent J. Catania, B.F.A.
Journalism
 Anthony M. Celata, M.Ed.
Hotel & Restaurant Management
 Somerville Public School System
 Linda A. Champa, M.A.
English
 Mintz Levin
 Robin M. Chandler, Ph.D.
African-American Studies
 Northeastern University
 Karen Cheeks-Lomax, J.D.
Law
 Attorney General's Office
 Michael D. Chefitz, J.D.
Business Law
 Gilbert, Kurent & Kiernen
 Kenneth Chernack, M.B.A.*
Information Systems
 Digital Equipment Corp.
 Joseph W. Chevarley, Jr., M.P.A.
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 Northeastern University
 Linda Chinsen, B.S.
Radiologic Technology
 Massachusetts Bay Community
 College
 Thomas J. Chuda, M.S.
Criminal Justice
 Bunker Hill Community College
 Nancy J. Chute, M.A.
Art
 Mary Beth Cicero, M.B.A.
Marketing
 Sepracor, Inc.
 Anthony Cicerone, Ph.D.*
Economics
 Bridgewater State College
 Claudia A. Clark, B.A.
Mathematics
 Digital Measurement Systems
 Leroy K. Clark, Ph.D.
Psychology
 Digital Equipment Corporation
 Kalo Clarke, M.A.
English
 Northeastern University
 Fred W. Claridge, Jr., M.S.*
Earth Science
 Wellesley Public Schools
 Howard S. Clayman, B.A.
Information Systems
 Dynamics Research Corp.
 Hermine M. Cleary, B.S.
*Alternative Freshman/Language
 Skills*
 Joseph Cleary, M.Ed.
Mathematics
 Massasoit Community College
 Paul F. Cleary, M.A.*
Economics
 Occupational Analysis

Jennifer L. Clifford, M.A.
Economics
 Langdon D. Clough, M.A.
Earth Science
 Commonwealth of Massachusetts
 Edward Coakley, B.S.
Nursing
 Massachusetts General Hospital
 Barbara A. Coarr, B.S.
Medical Laboratory Science
 Virginia Kelikian-Coburn, M.B.A.
Health Science
 Cathy Cogen, M.Ed.*
American Sign Language
 David Cohen, M.B.A.
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 Consultant
 Edward H. Cohen, M.S.
Earth Science
 College of Holy Cross
 Neil Cohen, J.D.
Health Management
 Richard A. Cohen, B.S.
Real Estate
 City of Boston
 Robert F. Cohen, M.S.*
Accounting
 Self-employed
 Annalee Collins, M.Ed., R.R.A.*
Health Information Administration
 Eleanor J. Collins, Ph.D., M.S.*
Alternative Freshman/Mathematics
 J. Stephanie Collins, Ph.D.
Information Systems
 Northeastern University
 Patricia M. Collyer, M.A.
Sociology/Anthropology
 Northeastern University
 Richard J. Colvario, M.Ed.
Information Systems
 Department of Revenue
 Gertrude A. Condon, M.Ed.
Criminal Justice
 Respond, Inc.
 Paul C. Condon, M.B.A.*
Marketing
 Xyplex Inc.
 Elizabeth M. Congdon, M.A.*
History
 Peabody School System
 Charles Conklin, M.B.A.
Health Information Administration
 Leonard M. Conlin, Sr., M.Ed.*
Mathematics
 Framingham North High School
 John F. Connelly, Ph.D.
Information Systems
 Boston Edison Company
 Timothy J. Connelly, M.B.A.
Accounting
 Brown Brothers Harriman
 Thomas F. Connerty, B.A.*
Information Systems
 New England Circuit Sales
 Patricia D. Connolly, B.S.
Alternative Freshman/Language Skills
 Joseph N. Connors, M.P.A.*
Political Science
 Commonwealth of Massachusetts
 John S. Corcoran, M.S.*
Technical Communications
 Self-employed

- Elizabeth M. Corea, M.A.
Speech Communication
Northeastern University
Peter V. Corea, Ph.D.*
Psychology
Emerson College
Dyer Cornell, M.B.A.*
Finance
Bank of Boston
Edward V. Cosgrove, Ph.D.*
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Children's Hospital
Ava M. Costello, M.A.
History
Northeastern University
Marie F. Costello, M.A.
Art
Mary Cotter, M.S.
Health Management
James W. Cottom, M.A.*
History
Massasoit Community College
Michael Cottrill, M.S.
Accounting
Northeastern University
William J. Coughlan, M.A.
Art
Blue Hills Regional Technical School
Barry J. Coughlin, M.B.A.
Management
Thomas F. Coveney, M.B.A.*
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Stone & Webster Eng. Corp.
William T. Cowan, M.A.
Alternative Freshman/English
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History
Big Alices Inc.
Steven Crapser, B.A.
Purchasing
The Kendall Company
Bryan D. Craven, B.S.*
Information Systems
General Electric Company
Salvatore A. Crisafulli, M.B.A.*
Information Systems
Career Management Assoc.
William F. Crittenden, Ph.D.
Management
Northeastern University
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Economics
Salem State College
Margaret E. Crohan, M.A.
Communication Studies
John F. Cronin, Jr., M.B.A.*
Accounting
Self-employed
Joseph V. Cronin, Jr., J.D.*
Business Law
Trial Court of the Commonwealth
Mary A. Cronin, M.B.A.
Human Resources Management
Harvard Law School
Hugh J. Crossland, LL.M.*
Business Law
Hugh J. Crossland, Attorney at Law
Bernard Crowley, M.B.A.
Finance
Putnam Investment
- Brian C. Crowley, M.B.A.*
Accounting
Graftel Systems Inc.
Mark D. Crowley, M.B.A.*
Accounting
Bot Financial Corporation
David M. Culver, Ph.D.*
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Bridgewater State College
Helen M. Curley, M.A.*
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Kathleen F. Curley, D.B.A.
Information Systems
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Art
Richard Curran, M.B.A.
Finance
New England Telephone
Robert S. Curtin, Ed.D.*
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Northeastern University
Ronald E. Cziki, M.S.
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Higher Education Information Center
Albert C. D'Amato, M.Ed.*
English
Northeastern University
Miriam F. D'Amato, M.A.*
English
Patricia Dacey, M.Ed.*
Career/College Transition
Higher Education Information Center
Robert E. Daidone, J.D.
Business Law
Ricklets, Uehlein & Son
Rosemarie A. Danner, B.A.
Accounting
Sutapa Dasgupta, M.A.
Economics
John J. Davey, B.S.
Real Estate
Davey Title Associates
Francis L. David, M.Ed.
Industrial Management
Self-employed
Edward S. Davidson, J.D.
Human Resources Management
Federal Labor Relations Authority
Robert E. Davis, M.B.A.*
Accounting
R.E. Davis and Assoc.
Marilyn L. Day, M.A.
English
Marblehead High School
Bruce A. Dean, J.D.
Criminal Justice
Suffolk County District Attorney's Office
Peter U. Decenzo, B.S.*
Mathematics
Peter F. DeCosta, M.S.
Earth Science
United States Army
John R. Deitrick, M.A.
English
Becker College
Anne-Marie Delaunay, M.A.
Modern Language
- George Delianides, M.B.A.
Marketing
Information Resources
Joyce Delorey, M.A.*
Alternative
Freshman/Mathematics
Northeastern University
Hershel A. Denker, B.S.
Marketing
Self-employed
Joseph B. DeRoche, M.F.A.*
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Northeastern University
Stephen R. Derosier, M.B.A.*
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Northeastern University
Carl F. DeSisto, M.S.
Transportation
Stone and Webster Engineering Corp.
Normand J. Desmarais, M.B.A.
Purchasing
LORAL
Richard K. Deveney, M.Ed.*
Mathematics
Boston Latin School
James D. Devlin, B.S.*
Marketing
Lewtan Technologies, Inc.
Maureen A. Devlin, M.Ed.
Education
Brian S. Dextradeur, B.S.*
Management Sciences
Polaroid Corp.
Jeffrey E. Di Iuglio, M.A.*
English/Spanish
Curry College
Donna M. DiGiovanni, B.F.A.
Art
Michael E. DiRamio, A.M.
Philosophy/Religion
Brown University
Francis J. Di Sabatino, M.A.*
Chemistry
Retired
Howard T. Dimmick, M.Ed.*
Earth Science
Town of Stoneham
Indralakshmi Din-Dayal, M.S.
Communication Studies
Massachusetts Institute of Technology
Janice Dipietro, D.B.A.
Accounting
Northeastern University
Rosemarie M. Dittmer, M.A.*
English
Sujata Dixit, Ph.D.
Health Science
Harvard School of Public Health
Rose A. Doherty, M.A.
English
Northeastern University
Marie L. Donahue, M.A.
Policing
Boston Police Department
Tiane Donahue, M.A.
Alternative Freshman/English
Northeastern University
Helen Donato, M.S.
Nursing
Diane M. Donatio, M.S.
English
- Jane A. Donnelly-Cruickshank, M.A.
Communication Studies
J.E. Burke High School
Shannon M. Donovan, M.S.
Finance
John Hancock Properties
Peter J. Dorfman, M.A.
Philosophy/Religion
Sybase, Inc.
Lynn E. Dornink, M.A.
Alternative Freshman/English
Mona M. Dorsinville, M.D.
Modern Language
Tufts University
Martha Dove, M.Ed.
Health Science
Beth Israel Hospital
David J. Downey, M.A.
English
Margaret A. Downey, M.A.
English
Ronald Draper, M.B.A.
Management Sciences
Gillette
Joan F. Drexelius, Ph.D.*
Communication Studies
University of Puerto Rico
Claire Driscoll, M.A.*
Alternative Freshman/Mathematics
James J. Driscoll, M.B.A.
Accounting
Environment Corporation
James L. Driscoll, M.B.A.
Accounting
Federal Deposit Insurance Corp.
John M. Driscoll, M.A.*
Economics
U.S. Postal Service
Michael Drues, Ph.D.
Chemistry
Neil F. Duane, M.S.
Technical Communications
Boston Documentation Design
Edward L. Dube, M.B.A.*
Management
ELD Associates
Ardyn E. Dubnow, M.B.A.*
Information Systems
Self-employed
Alan Dube, Ph.D.
Management Information Systems
Watson Wyatt Worldwide
D. Kerry Dugan, Ph.D.
Information Systems/Philosophy
Patricia H. Dugan, M.S.
Criminal Justice
Northeastern University
Paula Duggan, M.S.A.
Accounting
Federal Home Loan Bank of Boston
Daniel T. Dunn, Jr., D.B.A.*
Marketing
Northeastern University
Laura W. Dunn, M.A.*
English
Susan J. Dunnell, M.S.
Criminal Justice
Douglas F. Durant, Ph.D.*
Music
Northeastern University

- Thomas Dwyer, M.B.A.
Management
Boston University
William C. Dwyer, M.B.A.*
Management
William C. Dwyer Associates
Andrew E. Efsthathiou, B.A.*
Information Systems
Commonwealth of Massachusetts
David M. Ehrmann, B.S.*
Communication Studies
Harvard Community Health
James H. Elgin, M.B.A.*
Information Systems
Digital Equipment Corp.
Irene A. Elios, H.S.D.
Art
Bruce Elliott, Ph.D.
Biology
Beth Israel Hospital
Gloria S. Ellis, M.B.A.
Human Resources Management
Northeastern University
Michael Englander, M.B.A.
Management Information Systems
Trinity Catholic High School
Binnur Ercecm, M.A.
Sociology/Anthropology
Northeastern University
Fahri Ercecm, M.A.
Sociology/Anthropology
Mark Erickson, M.Ed.
Career/College Transition
Northeastern University
Ali S. Errishi, Ph.D.
Philosophy
Fitchburg State College
Virginia Eskin, M.A.
Music
Herbert J. Eskot, Ph.D.*
Economics
Kelly A. Evans, M.A.
Sociology/Anthropology
Richard P. Evans, M.Ed.
Human Resources Management
Management Collaborative
Mitchell D. Evich, M.A.
English
Robert M. Fahey, M.Ed.*
Information Systems
Siemens Nixdorf Information Systems
Edward S. Fallon, M.B.A.
Transportation
Defense Logistics Agency
Eugene F. Fallon, M.B.A.*
Finance
Thomas J. Fallon, M.B.A.
Marketing
Sharp Electronics
Jean Farley, M.A.
Health Science
Clarence Farr, Jr., M.B.A.
Information Systems
Paul F. Farrand, M.B.A.
Marketing
Framingham State College
Marianne Farrington, Ph.D.
Biology
NEAQ
William Farwell, M.S.
Criminal Justice
Commonwealth of Massachusetts
- Richard J. Faulstich, A.B.
Human Resources Management
Joseph R. Favaloro, M.B.A.*
Finance
Bank of Boston
Miriam Brooks Fawcett, M.F.A.
Art
Keane, Inc.
Carol A. Fay, M.A.
American Sign Language
Trudi R. Feinstein, Ed.D.*
Psychology
William M. Ferney, M.Ed.
Therapeutic Recreation
Right Turn, Inc.
George F. Ferrar, M.S.
Art
Art Institute
James F. Ferreira, M.B.A.*
Information Systems
TAC Health Care Group
Ted Ferretti, B.S.
MIS
Digital
James E. Ferrier, M.S.
Security
Northeastern University
Linda Ferrier, Ph.D.
Speech and Language
Northeastern University
James J. Ferriter, M.B.A.*
Health Management
Industrial Medical Center
William A. Ferson, M.A.*
Economics
U.S. Department of Labor
Robert Ferullo, Ed.D.
Speech and Language
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Health Science
Northeastern University
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Accounting
Charles A. Findley, Ph.D.*
Communication Studies
Janet E. Fine, M.S.
Criminal Justice
District Attorney's Office
Francis X. Finigan, M.Ed.*
Mathematics
Educational Consultant
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Mathematics
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Marketing
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Health Information Systems
Commonwealth of Massachusetts
Leo J. Fitzgerald, M.B.A.*
Management
J. Joseph Fitzsimmons, M.B.A.*
Management
Polaroid Corp.
Roberta Fitzsimmons, J.D.*
Business Law
Law Offices of Roberta Fitzsimmons
John M. Flaherty, M.B.A.
Accounting
Harvard Pilgrim Health Care
- Joseph P. Flaherty, M.A.
History
Belmont High School
Ruth W. Flaherty, J.D.
History
Office of Senator Wetmore
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Sociology/Anthropology
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Finance
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Health Management
Self-employed
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English
Boston University
Peter E. Flynn, J.D.*
Real Estate
Law Office of Peter Flynn
Philip S. Fogelman, M.A.*
Alternative Freshman/English
John R. Foley, M.B.A.
Finance
Robert E. Foley, M.B.A.
Finance
The Registry, Inc.
Jeffrey Fontana, M.A.
Art
Boston University
Richard Foote, M.B.A.
Management
John Hancock Funds
Anthony F. Ford, Ph.D.
Modern Language
Northeastern University
Melissa Forman, M.Ed.
Health Management
Armand L. Fortin, B.S.*
Purchasing
LORAL Infrared & Imaging Systems
James Foss, Jr., LL.B.*
Human Resources Management
Federal Mediation and Counseling Services
Gale P. Foster, B.S.*
Marketing
Foster & Associates
Charles F. Fountain, M.S.
Journalism
Northeastern University
Robert M. Fox, M.B.A.*
Marketing
Gerber Electronics
Laura L. Frader, Ph.D.
History
Northeastern University
Diane Franklin, Ph.D.
Human Resources Management
Northeastern University
Robert G. Frazier, B.A.
Information Systems
Sinnott School
Howard H. Freedman, M.S.*
Accounting
Raytheon Company
Paula M. French, M.B.A.
Management
Northrop Corporation
John H. Friar, Ph.D.
Marketing
Northeastern University
Robert L. Fulford, B.S.
Purchasing
Varian/IOM Implant Systems
- Mira A. Furth, M.Ed.
Career/College Transition
Furth Associates
Gerald Galvardi, B.S.
Health Information Administration
New England Deaconess Hospital
John F. Garvey, M.A.
Alternative Freshman/English
Martin J. Gately, J.D.
Real Estate
Law Offices of M. Gately
David M. Gavigan, M.A.
Criminal Justice
Camp Curtis Guild
Paul C. Gay, J.D.*
Business Law
Paul C. Gay, Attorney at Law
Jonathan M. Geer, B.S.
Earth Science
Commonwealth of Massachusetts
Department of Environmental Management
Sandra E. Geer, M.Ed.*
Psychology
Louis C. Generazzo, M.A.*
Art
Kathryn E. Genovese, B.A.
Management Information Systems
Fidelity Investments
Michael P. Gerace, Ph.D.
Political Science
Anne M. Germain, Ph.D.*
Information Systems
Self-employed
Jeannette Gerzon, M.B.A.
Career/College Transition
Ara Ghazarians, M.A.
Sociology
Emerson College
David M. Ghazil, M.B.A.*
Human Resources Management
LORAL
James G. Giammarinaro, M.B.A.
Finance
Avery Dennison
Peter C. Gianoukos, M.S.
Management Sciences
Self-employed
Richard Giardina, B.S.
Biology
Brigham and Women's Hospital
Dominic Giarratani, J.D.
Real Estate
U.S. Postal Service
Adrian T. Gilbert, M.S.*
Biology
Northeastern University
Elizabeth Gilman, M.S.
Health Science
Massachusetts Institute of Technology
Alan B. Gladstone, B.S.*
Accounting
Alan Gladstone, CPA
Michael Gladstone, M.B.A.
MIS
Northeastern University
Harvey Glass, J.D.
Human Resources Management
Shlomo S. Globerson, D.B.A.
Management
Northeastern University

- Victor B. Godin, D.B.A.
Information Systems
Northeastern University
Pradeep Goel, M.D.
Health Science
Brigham and Women's Hospital
Bernadette Golas, M.B.A.
Marketing
Multilink Inc.
Robert L. Goldberg, M.B.A.*
Management
National Investment Co.
William L. Goldberg, M.B.A.
Management
Hyde Athletic Industries
Daniel Golden, Ph.D.*
English
Wheaton College
Frederick T. Golder, Esq., LL.M.*
Human Resources Management
Self-employed
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Information Systems
Consultant
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Sociology/Anthropology
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Kimberly Gomes, B.S.
Radiologic Technology
Charlton Memorial Hospital
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Economics
Salem State College
Myron S. Goretzky, Esq., J.D.
Hotel and Restaurant Management
New Hampshire Technical Institute
Linda Gorham, M.B.A.
Finance
Ross Crossland Weston Securities Co., Inc.
Maureen F. Goss, Ph.D.
Art
Harvard University
Leslie C. Gosule, B.S.*
Accounting
Leslie C. Gosule & Company
Daniel Z. Gould, M.B.A.*
Industrial Management
GTE
Helen F. Gould, M.S.
Nursing
Veterans Hospital
Leroy Gould, B.S.
Information Systems
Polaroid
Frank S. Govern, M.S.
Health Management
JCRT Harvard Medical School
John M. Grady, Ph.D.
Sociology/Anthropology
Wheaton College
William E. Grady, M.B.A.*
Industrial Management
Grady & Associates
Daniel J. Grant, Jr., M.A.*
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Fitchburg State College
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MDC
- Albert E. Gravelle, M.P.A.
Transportation
Mass Bay Transportation Authority
Arthur M. Graziano, B.S.*
Human Resources Management
Graziano Associates
Harvey Green, Ph.D.
History
Northeastern University
Lewis Greenberg, M.A.*
Psychology
Arlene Greenstein, Ph.D.
Speech and Language
Northeastern University
John T. Gregg, B.A.*
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Beal & Company
Kristo A. Gregory, M.B.A.*
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Prudential Bache Securities
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Christine M. Griffin, M.A.
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Northeastern University
Gerald R. Griffin, Ph.D.*
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Northeastern University
John L. Griffith, B.S.*
Management
Griffith Associates, Inc.
Randall P. Grometstein, J.D.
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Nancy B. Gruskin, M.A.
Art
Biao Gu, Ph.D.
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Paul E. Guay, M.A.
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Berklee College of Music
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Business Law
Guisbond & Bonn
Anthony J. Gully, M.A.
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District Court
Margaret E. Gundal, M.A.
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Herbert R. Haber, M.A.
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Useable Portable Publications Inc.
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Goddard Memorial Hospital
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Haggis Consulting
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Lawrence-Eagle Tribune
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M/C Partners
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Lexington Strategic Associates
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Beth Israel Hospital
Patricia Hartnett, A.S.
Radiologic Technology
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Heald Hoffmeister and Co.
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Business Law
Federal Deposit Insurance Corporation
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Brigham & Women's Hospital
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Neponset Valley Health Services

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 Massachusetts Department of
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 Massachusetts State Police
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 Weymouth High VocTech
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 Timothy F. Landy, B.S.
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 Commonwealth of Massachusetts
 Norma Jane Langford, M.S.
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 Irma Lauter, M.S.
MIS
 NYNEX
 Thomas A. Lawler, M.S.
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 Self-employed
 Charles E. Lawton, M.Ed.*
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 Rhode Island College
 Alfred Lazzeri, M.F.A.*
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 Freelance Artist
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 M/A Com Inc.
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 Bank of Boston
 Cynthia Lee, Ph.D.
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 Northeastern University
 Patricia Lee
Medical Laboratory Science
 Childrens' Hospital
 Robert G. Lee, A.S.
American Sign Language
 Deaf, Inc.
 Constance Leigh, M.A.*
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 College
 M. X. Lesser, Ph.D.
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 T.S.G. Inc.

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 Lawrence J. Levine, Ed.D.
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 Northeastern University
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 Rehab & Re-employ
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 The Corporate Media Group
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American Sign Language
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Sociology/Anthropology
 Xiaolan Liu, Ph.D.
Sociology/Anthropology
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 Boston VA Medical Center
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 C.A.G.S.
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 Atlantic Resources
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 Medical Records Associates
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 Management Services
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History/Anthropology
 Christopher F. Ludwig, B.F.A.
Art
 Robbins Company
 Maureen C. Lynch, M.A.*
English
 Self-employed
 Karen M. Lyons, M.B.A.
Management
 Fidelity Investments
 Maura E. Lyons, M.A.
Art
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Management
 Lyons Real Estate
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 Cambridge School Department
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 New England Medical Center
 Hospital
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 Town of Norwood

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 Lasell College
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 Assabet Valley Home Health
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History
 Northeastern University
 William S. Mullen, M.A.*
Political Science
 Foxboro School System
 Kevin P. Mulvey, Ph.D.
Sociology/Anthropology
 Christine L. Munger, M.B.A.
Finance
 Milford National Bank
 Charles W. Murphy, M.B.A.*
Finance
 Bunker Hill Community College
 Daniel C. Murphy, M.S.*
Journalism
 New England Newspaper Assoc.
 David M. Murphy, Ph.D.
Communication Studies
 Boston College
 Kellianne M. Murphy, M.A.
English
 Northeastern University
 Paul J. Murphy, J.D.*
Management
 General Electric Company
 Richard T. Murphy, M.Ed.*
Mathematics
 Boston Public Schools
 Thomas J. Murphy, M.B.A.
Marketing
 Digital Equipment Corp.
 Charles J. Murray, Ph.D.
Technical Communications
 Oracle Systems Corp.
 Claire A. Murray, M.Ed.
Human Resources Management
 James F. Murray, J.D.
Real Estate
 Law Office of Peter Flynn
 Michael A. Musi, J.D.
Marketing
 Kenan Systems Corp.
 John A. Mylotte, B.A.*
Technical Communications
 TechWrite Associates
 Laurie Nardone, M.A.
Alternative Freshman/English
 Northeastern University
 Mohammad A. Nawawi, Ph.D.
Political Science
 Barbara E. Neale, M.Ed.*
Communication Studies
 Independent Concept Consultants
 Maureen J. Nelligan, M.B.A.
Accounting
 Northeastern University
 Thomas J. Neylon, M.A.*
English
 Watertown Public Schools
 Janet M. Nichols, M.B.A.*
Management
 Small Business Consultant
 Maris Nichols, M.A.
English
 Bruce E. Nickerson, Ph.D.*
English/Anthropology
 Christ Episcopal Church

- Hope A. Nilsson, B.S.
Art
James A. Nocito, M.Ed.
Modern Language
Westwood High School
Seyed H. Noorian, M.B.A.
Finance
Boston University
Maureen A. Norton Hawk, M.S.W.
Sociology/Anthropology
Northeastern University
Richard W. Norton, B.A.*
Information Systems
Vincent G. Norton, M.B.A.*
Human Resources Management
Raytheon Company
Donald J. C. Novak, Ph.D.*
Philosophy/Religion
Massachusetts General Hospital
Edward G. Novello, M.B.A.*
Transportation
Best T&D Associates
Michael M. Noye, M.B.A.
Accounting
Varian Assoc.
Norbert F. Nunes, M.A.*
English
Massachusetts Bay Community College
Jason C. Nwanko, Ph.D.
Sociology/Anthropology
Fitchburg State College
John E. O'Brien, M.B.A.*
Human Resources Management
MHA Insurance Agency, Inc.
Lolly Ockerstrom-Snyder, M.A.
English
Northeastern University
Elizabeth A. O'Connell, M.Ed.
Human Resources Management
Marshfield Public School
Frederick T. O'Connell, J.D.*
Accounting
US Treasury Department
Daniel F. O'Connor, M.S.*
Information Systems
Bus-Tech
Edward J. O'Connor, B.A.*
Information Systems
GTE Systems
Aileen J. Ofer, M.A.*
English
Moshe Ofer, M.A.
Political Science
Amy Offenberg, M.Ph.
Health Science
Roxbury Community Health Center
Richard S. Offenberger, Ph.D.
Alternative Freshman/Management/History
R.S.O. Associates
Margaret O'Kelly, M.B.A.
Accounting
Northeastern University
Russell W. Olive, D.B.A.
Accounting
Northeastern University
Ernest Oliveira, Jr., M.B.A.*
Industrial Management
General Electric Company
- Paul Olsen, D.B.A.
Management
George C. Olson, M.B.A.*
Information Systems
Ronald K. Olson, B.A.*
Information Systems
Concentra, Corp.
Susan J. Olson, B.S.
Medical Laboratory Science
Northeastern University
David S. Omar, M.B.A.*
Economics
Dean Junior College
Thomas Omer, Ph.D.
Accounting
Northeastern University
Leo F. O'Neill, B.S.
Medical Laboratory Science
New England Deaconess Hospital
Laurence M. Onie, M.S.W.
Communication Studies
Onie Assoc.
Gary S. Osmond, M.B.A.
Finance
Town of Wayland
Daniel J. Pagnano, Esq., J.D.
Human Resources Management
Private Arbitrator
Robert Palladino, M.B.A.
Finance
Dennison Company
Judith A. Palumbo, M.B.A.
Human Resources Management
Massachusetts Hospital Association
Hui Pan, Ph.D.
Economics
Kwamina Panford, Ph.D.
African-American Studies
Northeastern University
Christine Paolillo, J.D.
Medical Laboratory Science
New England Baptist Hospital
Robert J. Pappalardo, B.A.
Art
R. Pappalardo Associates
George J. Parangimalil, M.A.
Sociology/Anthropology
Elizabeth Parfennk, B.S.
Earth Science
Judith M. Pariseau, B.S.*
Biology
Northeastern University
Cynthia J. Parker, B.S.
Management
Clean & Sweep, Inc.
Robert G. Parker, M.B.A.
Marketing
Management Consultant
Robert H. Parris, M.A.
Corrections
U.S. Probation System
Ann C. Parsons, M.A.
Alternative Freshman/Mathematics
Robert A. Parsons, M.B.A.*
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Northeastern University
Virginia C. Parsons, M.A.
English
Anthony F. Pastelis III, M.Ed.
Journalism
Archdiocese of Boston
Herbert S. Patchell, M.A.*
Philosophy/Religion
- David F. Pauling, M.A.*
Modern Language
Tufts University
Benham Pavaresh, HS.D.
Radiologic Technology
Brigham and Women's Hospital
Susan W. Pease, M.B.A.
Technical Communications
Aetna Life & Casualty
Kim A. Pederson, M.F.A.
English
Charles River Assoc.
Peter E. Perroncello, M.S.*
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Norfolk County Sheriff's Office
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Health Management
Laboure College
Daniel Pershonok, Ph.D.*
Psychology
Harvard Medical School
Daniel P. Petinge, M.B.A.*
Purchasing
Ausrele M. Petronis, M.A.*
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Peter T. Philliou, Ph.D.*
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Wentworth Institute
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Axiom
Samuel H. Pierce, M.B.A.
Finance
MetLife
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Human Resources Management
Massasoit Community College
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Information Systems
Fidelity Investments
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Marketing
Prevision Marketing Inc.
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Industrial Management
Polaroid Corp.
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Gladys M. Polansky, M.A.*
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Suffolk County
Jonathan Pond, D.B.A.
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Hotel and Restaurant Management
Massasoit Community College
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Accounting
Junior Achievement of Central Mass.
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Judson Associates
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Simplex Time Recorder Co.
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Salil V. Pradhan, M.S.
MIS
Mark Prendergast, M.B.A.
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Health Science
Northeastern University
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Management
Sheila M. Puffer, Ph.D.
Human Resources Management
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Advertising Age Magazine
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Health Information Administration
Childrens' Hospital
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Chapar Graphic Design Studio
John E. Rainey, M.B.A.
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Clark University
Dolly S. Raja, M.A.
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Division of Employment Security
Ravi Ramamurti, D.B.A.
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Therapeutic Recreation
Ronald Raphael, M.Ed.
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Raphael Associates
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New England Deaconess
Bernard R. Redgate, M.S.*
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Framingham Public Schools

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 William Reiff
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 Northeastern University
 Suzanne S. Reilly, M.A.
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 Michelle B. Remaud, M.A.
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Art
 Photopia
 Randolph W. Rhoda, M.B.A.
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 Laurie Riccio, J.D.
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 EMR Associates
 Neil Rich, M.S.E.E.
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 Abucos Consulting
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 Human Resource Institute
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 Digital
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 Patricia N. Rissmiller, Ph.D.
Nursing
 Simmons College
 Lorna Rivera, M.A.
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 Law Offices of Joseph Edward Rizzo
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 Massachusetts Department of
 Corrections
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 Holly Robinson, M.F.A.
English
 Raymond H. Robinson, Ph.D.
History
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 Cephas B. Rogers, M.B.A.*
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 Nypro, Inc.
 Beverly L. Rolker-Dolinsky, Ph.D.
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 Endicott College
 Brian Roman, J.D.
Criminal Justice
 Suffolk County District Attorney
 Irene L. Roman, Ph.D.*
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 UMass/Boston
 Bruce Ronkin, D.M.A.
Music
 Northeastern University

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 Steven M. Rose, C.P.A.
 Fred A. Rosenberg, Ph.D.
Biology
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 Lori F. Rosenberg, M.A.
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 Suffolk University
 Victor L. Rosenberg, D.B.A.
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 Sheri L. Rosenzweig, B.A.
Art
 Putnam Investments
 Norma P. Rosin, M.Ed.*
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 Mark Rossi, B.S.
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 Richard N. Roy, M.B.A.*
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Economics
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 Gerald R. Rubin, B.S.*
Accounting
 Greene, Rubin, Miller, Pacino
 Peter C. Rubinger, M.B.A.
Accounting
 P. Rubinger
 Thalia Rubio, M.Ed.
Technical Communications
 Midtown Writing
 Timothy J. Rupert, Ph.D.
Accounting
 Northeastern University
 Stanley H. Rutstein, M.B.A.
Marketing
 S/J Designs, Inc.
 Charles M. Ryder, M.B.A.
Management
 New England Mutual Life
 Insurance Co.
 Frederick J. Rys, M.B.A.*
Finance
 Harwich Associates
 Alexander R. Rysman, Ph.D.*
Sociology/Anthropology
 Romm and Company
 Adina E. Sabghir, M.F.A.
Art
 Robert St. Cyr, M.A.
Human Resources Management
 Massachusetts Institute of
 Technology
 Thaddeus P. Sadowski, M.Ed.*
Mathematics
 Hershel J. Sahian, M.A.
Political Science
 John A. Saltmarsh, Ph.D.
History
 Northeastern University
 James B. Sampson, Ph.D.*
Psychology
 U.S. Army Natick RD&E Center
 Paul E. Sanders, M.B.A.*
Finance
 Babson School of Executive
 Education

Jayant N. Sane, Ph.D.*
Chemistry
 The Gillette Company
 Richard H. Saracusa, M.B.A.*
Information Systems
 Polaroid Corp.
 Ahmad Saranjani, M.A.*
Economics
 Ravi Sarathy, Ph.D.
Management
 Northeastern University
 Patricia J. Sardella, B.A.
Sociology/Anthropology
 Keith C. Saunders, M.A.
Sociology/Anthropology
 Northeastern University
 Brenda A. Schertz, B.F.A.
American Sign Language
 John J. Schickling, M.B.A.*
Accounting
 Business Consultant
 Patricia M. Schilling, M.B.A.
Human Resources Management
 Mark B. Schmidt, J.D.
Real Estate
 Schmidt & Moore
 Roy M. Schoenfeld, J.D.
Human Resources Management
 National Labor Relations Board
 Rodney Schonland, M.B.A.*
Transportation
 Polaroid Corp.
 Susan M. Schrader, M.B.A.
Marketing
 Wildfire Communication Corp.
 Frank A. Schubert, J.D.
Law
 Northeastern University
 Lawrence S. Scott, Ph.D.
Alternative Freshman/Sociology/
Corrections
 Bunker Hill Community College
 Jeanne M. Segal, M.A.
Music
 Northeastern University
 Robert Seger, B.A., RRA
Health Information Administration
 Massachusetts General Hospital
 Carol J. Seidman, B.A.
American Sign Language
 Peter M. Selig, M.A.*
Economics
 Raytheon Company
 Patricia C. Selleck, B.S.
Radiologic Technology
 St. Anne's Hospital
 Peter Serenyi, Ph.D.*
Art
 Northeastern University
 Rose A. Sergi, M.A.*
English
 Middlesex Community College
 Susan M. Setta, Ph.D.*
Philosophy/Religion
 Northeastern University
 Kathleen M. Sevigny, M.B.A.*
Accounting
 Bridgewater State College
 Laurie C. Shaffer, M.S.
American Sign Language
 John C. Shannon, M.A.*
Economics
 Suffolk University

Arthur G. Shaw, Ed.D.
Mathematics
 AGS Associates
 Corey C. Shaw, J.D.
Law
 Law Offices of Corey Shaw
 David M. Shaw, LL.M.
Real Estate
 Law Office of David M. Shaw
 John T. Shea, B.S.
Art
 Southeastern Regional High
 School
 Ruth C. Sheehan, M.A.
Communication Studies
 Marjorie K. Shelley, Ph.D.
Accounting
 Northeastern University
 Sherry R. Shepler, M.A.
Communication Studies
 Northeastern University
 Elena Sheppa, M.A.
Art
 Joseph R. Sheppeck, M.B.A.
Mathematics
 John Hancock Life Insurance Co.
 Eliot H. Sherman, CPA*
Finance
 American International Security
 Corp.
 H. David D. Sherman, D.B.A.
Accounting
 Northeastern University
 Kimberly A. Shilland, M.A.
Art
 MIT Museum
 Stephen M. Shinnick, M.P.A.*
Political Science
 Norwood Public Schools
 Ruth E. Shore, M.A.*
English
 Stephanie Shute-Kelsch, M.A.
English
 Westwood High School
 Susan F. Sietloff, M.B.A.*
Marketing
 Donna P. Signorile, B.S.*
Biology
 Brockton Hospital
 Andrew Silverman, M.S.*
Accounting
 Andrew Silverman, C.P.A.
 George H. Simmons, M.A.*
Economics
 Bay State Gas
 S. Murray Simons, Ed.D.*
Accounting
 Stuart Management Systems
 Andrea Simonson, Ph.D.
Speech & Language
 Sandra J. Simpson, M.S.
Communication Studies
 Simpson Associates
 Michael Singer
Chemistry
 Organix Inc.
 Caroline M. Sirois, M.A.
Alternative Freshman/English
 Alexander A. Skavenski, Ph.D.
Psychology
 Northeastern University
 David H. Skill, M.A.
Technical Communications
 WATD Radio

- Stephen E. Slaner, M.Phil.*
Political Science
Marjorie T. Slater, B.S.
Journalism
Self-employed
Charles E. Smith, B.A.
Marketing
The Pepperell Group
Charles H. Smith, M.P.A.
Health Management
George A. Smith, B.S.
Transportation
Treasury Department, U.S.
Government
Ginger M. Smith, M.Ed.
American Sign Language
Horace Mann School
Marie E. Smith, C.A.G.S.
Career/College Transition
Lasell College
Maureen Smith, J.D.
Health Science
Labouré College
Robert W. Smith, B.S.*
Human Resources Management
Northrop Corp.
Paul E. Snoonian, Sr., Ph.D.*
Economics
University of Massachusetts/
Lowell
Edward J. Socha, M.B.A.*
Management
Claudia I. Sokol, M.D.
Modern Language
Kenneth C. Solano, M.Ed.*
Human Resources Management
Northeastern University
Nancy A. Solano, M.Ed.
Human Resources Management
Medford Public Schools
Marius M. Solomon, Ph.D.
Management Sciences
Northeastern University
Samuel B. Solomon, M.B.A.
Accounting
Northeastern University
George J. Soukaros, Ed.D.*
English
Marlboro High School
Alvaro M. Sousa, B.S.*
Management
Edward L. Sousa, M.Ed.*
Information Systems
Northeastern University
Robert V. Sparks, Ph.D.
History
Judith M. Sparrow, M.B.A.
Management
The Network
Elliot Spector, Ph.D.*
Health Science
Robert M. Spector, Ph.D.*
Business Law
Worcester State College
Susan Spilecki, M.F.A.
English
Emerson College
Ruth N. Spillberg, M.A.
Speech Communication
Curry College
Harlan Spotts, Ph.D.
Marketing
Northeastern University
- Ayodya N. Srivastava, M.B.A.
Industrial Management
Market Force
Richard M. Staley, M.S.
Earth Science
Newton Public Schools
Joseph V. Stanford, M.B.A.*
Finance
Self-employed
Gilbert F. Starble, B.S.
Real Estate
Centurion Funding Group
Thomas Stark, M.B.A.
Finance
William I. Staton III, M.S.
American Sign Language
Robert St. Cyr, M.A.
Human Resources Management
Massachusetts Institute of
Technology
Jody Steiner, B.A.
American Sign Language
Kellie L. Stewart, B.A.
American Sign Language
Harvard University
Edmund L. Stoddard, M.S.*
English
Joseph F. Stoltz, Ph.D.*
Economics
U.S. Department of Labor
John W. Stout, M.A.*
Political Science
Roger Williams University
Walter D. Stringer, B.S.*
Purchasing
Michael F. Strmiska, M.A.
Philosophy/Religion
Robert W. Stuart, Ph.D.
Management
Northeastern University
Edward Sulesky, J.D.*
Business Law
District Court of Concord
Jeremiah J. Sullivan, Jr., J.D.*
Human Resources Management
John F. Sullivan, J.D.
Business Law
Town of Bedford Public Schools
John F. Sullivan, B.S.
Human Resources Management
Market Enterprises
John R. Sullivan, M.A.
English
Concentric Data Systems Inc.
Paul J. Sullivan, J.D.
Criminal Justice
Defense Logistics Agency
Stephen G. Sullivan, B.S.
History
Mintz and Hoke
Windsor Sung, Ph.D.
Earth Science
ABT Associates
Daniel F. Sutton, J.D.
Human Resources Management
Federal Labor Relations
Authority
Deborah Swanson, M.A.
Sociology/Anthropology
Northeastern University
William R. Swanson, J.D.
Finance
Bose Corporation
- William R. Swartz, M.B.A.*
Purchasing
Axis Computer Systems, Inc.
Albert J. Sweeney, M.P.A.
Policing
Boston Police Department
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Marketing
Sweeney Associates
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Accounting
FDIC
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American Sign Language
Northeastern University
Lawrence E. Symington, Ph.D.*
Psychology
U.S. Army R&D Center
Michael Szule, B.S.
Chemistry
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Melissa Tackett Gibson, M.A.
Sociology/Anthropology
Northeastern University
Thomas J. Tagliamonte, M.B.A.*
Management
New England Mutual Life
Insurance Co.
Paul D. Talagan, M.A.
Psychology
Cambridge Counseling Associates
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Art
Communication Graphics
Sumner B. Tapper, M.Ed.*
English
Theodore A. Tasis, M.A.*
English
Alan M. Tattle, M.Ed.*
Information Systems
Lynn School Department
Laura Taylor, B.A.
Computer Literacy
WT Chem and Co.
Nancy Taylor, M.S.
Therapeutic Recreation
Jewish Memorial Hospital
John B. Tessicini, M.B.A.*
Human Resources Management
ENRON
Norman R. Tessier, C.A.G.S.*
Accounting
Self-employed
Mark Thomas, A.S.
Radiologic Technology
Norwood Hospital
Ronald R. Thomas, Ph.D.
Management
Northeastern University
Phillip W. Thompson, M.S.
Marketing
Pims Assoc. Inc.
Seymour Tilles, Ph.D.
Management
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Communication Studies
Muriel S. Snowden Int.
High School
Roy M. Tollefsen, Ph.D.*
Political Science
Edward Toomey, M.Ed.
Health Management
Veterans Administration
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Mathematics
Ashland High School
Frank M. Tortora, M.A.*
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Northeastern University
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Pine Manor College
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Mathematics
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Lawrence E. Towle, M.B.A.
Accounting
Adrianna C. Toyias, M.A.
Sociology/Anthropology
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Information Systems
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Finance
Northeastern University
Schuyler C. Traugher, M.A.
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Berklee College of Music
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Laurie Ann Tunnera, A.S.
Radiologic Technology
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Music
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Management Sciences
Salem State College
Donat A. Valcourt, B.S.*
Information Systems
Self-employed
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Management
Middlesex Community College
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Technical Communications
Telecommunications Magazine
Petros Vamvakas, M.A.
Political Science
Allison Associates
Frederick Van Bennakam, M.B.A.
Management
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Marion M. Van Nostrand,
M.L.S.*
Alternative Freshman/English

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Finance
 Securities and Exchange
 Commission
 Daniel R. Vardaro, B.S.*
Art
 Minuteman Tech
 Devi Venugopal, M.S.
Biology
 Northeastern University
 Heidi Vernon-Wortzel, Ph.D.
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Human Resources Management
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 Boston Police Department
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 Eleanor F. Wachs, Ph.D.
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 Art Institute of Boston
 Nina Walker, M.A.
English
 Nancy R. Walla, M.Ed.
American Sign Language
 H. Mann School for the Deaf
 Denise V. Wallace, M.S.
Criminology Research
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 Self-employed
 Martin S. Walsh, M.A.*
History/Management
 Huntington Consultant Group
 William F. Walsh, M.Ed.*
Marketing
 Bill Walsh Associates
 Benzhou Wang, M.A.
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 Pughang Wang, Ph.D.
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MIS
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 Northeastern University
 Louis Warren, B.S.
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 Lois D. Wasserman, Ph.D.*
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 Braintree Library
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Information Systems
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 Ernest Waterman, M.S.
Earth Science
 USEPA

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 Sheila P. Waxman, D.M.A.
Music
 Robert C. Webb, Ph.D.*
Psychology
 Suffolk University
 Robert L. Webb, M.Ed.*
Human Resources Management
 Boston Gas Company
 Richard S. Wein, M.A.*
Sociology/Anthropology
 Rory B. Weiner, Ph.D.
Philosophy/Religion
 Susan I. Weiner, M.S.
Accounting
 Bolt Beranek & Newman
 Sara C. Weintraub, Ph.D.*
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22	John D. D'Bryant African-American Institute (AF)	24	Holmes Hall (HD) TTY: Rm 276
12	Barletta Auditorium (BH)	55	236 Huntington Avenue (HU)
19	Bailey Plant	10	Hunting Hall (HT)
11	Cabot Physical Education Building (CB) TTY: Rm 110	26	Kariotis Hall (KA)
39	Cahners Hall (CA) TTY: Rm 151	41	Kerr Hall (Faculty Center) (KH)
28	Cargill Hall (CG)	29	Knowles Center (KN)
13	Churchill Hall (CH)	25	Lake Hall (LA) TTY: Rm 203
62	Classroom Building (CL)	63	Roger M. and Michelle S. Marino Recreation Center
59	Columbus Place (716 Columbus Avenue) (CP)	57	Matthews Arena (MA)
9	Cullinane Hall (CH)	58	Matthews Arena Annex (MX)
40	Cushing Hall (CU)	20	Meserve Hall (ME) TTY: Rm 3DS
14	Dana Research Center (DA)	5	Mugar Life Science Building (Peabody Health Professions Center) (MU)
27	Dockser Hall (DK) TTY: Rm 107	18	Nightingale Hall (NI) TTY: Rm 125
6	Dodge Hall (DG)	31	Parker Building (PA)
61	Maureen and Richard J. Egan Engineering/Science Research Center	2	Richards Hall (RI) TTY: Rms 150, 254
3	Ell Student Building (Auditorium) (EL) TTY: Rms 04, 104	8	Robinson Hall (RB)
4	Ell Student Center (Student Lounge) (SC) TTY: Rm 255	21	Ryder Hall (RY) TTY: Rms 170, 180, 251, 270
56	Field Street (FS)	15	Snell Engineering Center (SN) TTY: Rm 120
16	Forsyth Building (FR) TTY: Rms 100, 135	60	Snell Library (SL) TTY: Reference Desk
17	Forsyth Building Annex (FA)	50	122 St. Stephen Street (SS)
38	Forsyth Dental Building (FE)	30	Stearns Center (ST) TTY: Rm 302
1	Hayden Hall (HA) TTY: Rms 120, 202	32	26 Tavern Road (TA)
33	Hillel-Frager (HF)		

Key

 Academic, residential,
and service buildings

Handicap parking

Accessible routes

Parking areas

Street direction

Underground tunnel

Emergency telephone

TTY locations

 See alphabetic list of buildings
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TTY: Rm 000

 Maps are provided by the Information Center, 116
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Some buildings on this map are used but not owned
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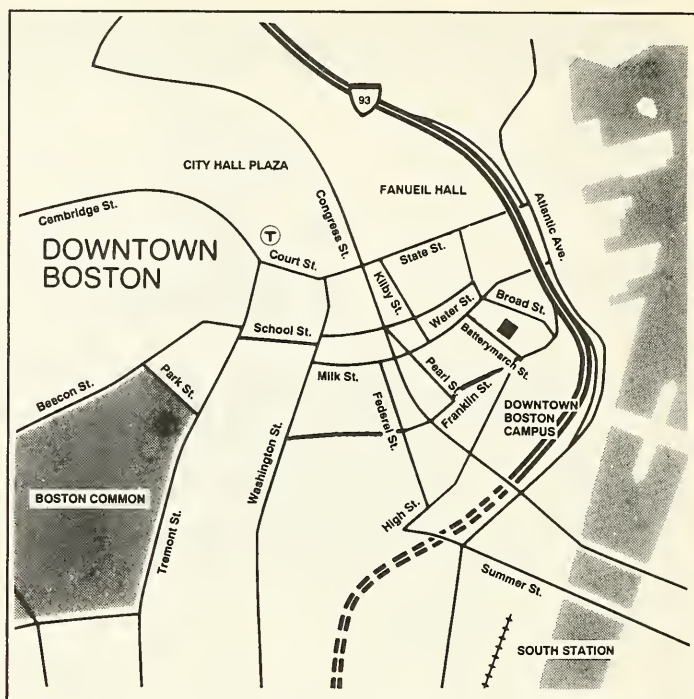
Residence Buildings

34	Burstein Hall	45	Lafman Hall and 153 Hemenway Street
43	Kennedy Hall	42	Melvin Hall
46	142-148 Hemenway Street	35	Rubenstein Hall
45	153 Hemenway Street and Lafman Hall	44	Smith Hall
7	316 Huntington Avenue (Northeastern at the YMCA)	49	Speare Hall
52	319 Huntington Avenue	48	Stetson East TTY (public)
51	337 Huntington Avenue	47	Stetson West
36	407 Huntington Avenue	50	106/110/116/122 St. Stephen Street
41	Kerr Hall	23	Willis Hall
53	Light Hall	37	White Hall
		54	400 The Fenway

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89 Broad Street

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Exit at Old State House. Walk
down State St., cross Congress
St. to Broad St. Take right on
Broad St. to 89 Broad St.



Burlington Campus

South Bedford Street
Burlington High School
123 Cambridge Street

Burlington Campus

From 128 North or South, take
Exit 33A and follow to South
Bedford Street. Take right at
lights and go 3/10ths mile to
university entrance on your
left.

Burlington High School

From Rte. 128 South to exit
33B (Rte. 3A). Take right at
end of exit ramp. Approx. 1/4
mile to Football Stadium on
left. Take left at lights.
From Rte. 128 North to Exit
33B (Rte. 3A). At end of exit
follow approx. 1/4 mile to
Football Stadium on left and
second set of lights. Take left
at lights.

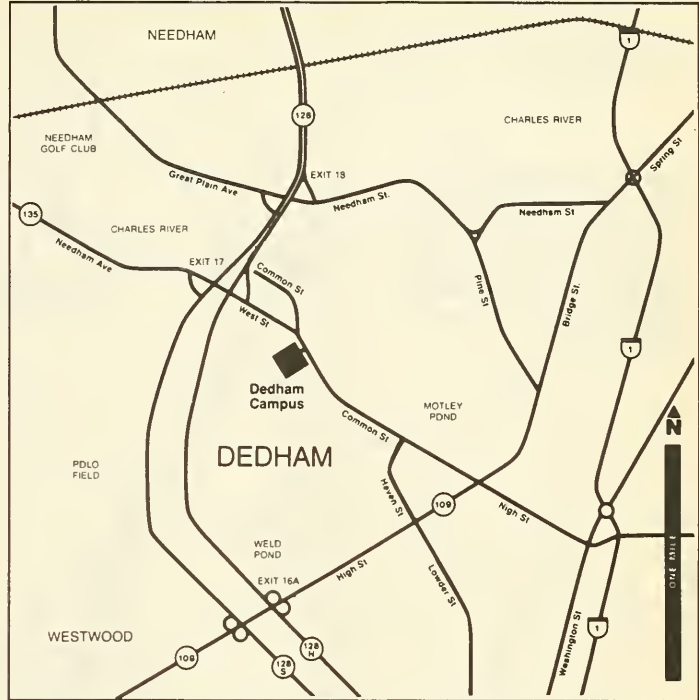


Dedham Campus

370 Common Street

From Rte. 128 South, take Rte. 135 Exit. Turn right at end of ramp and follow Common St. to campus on the right.

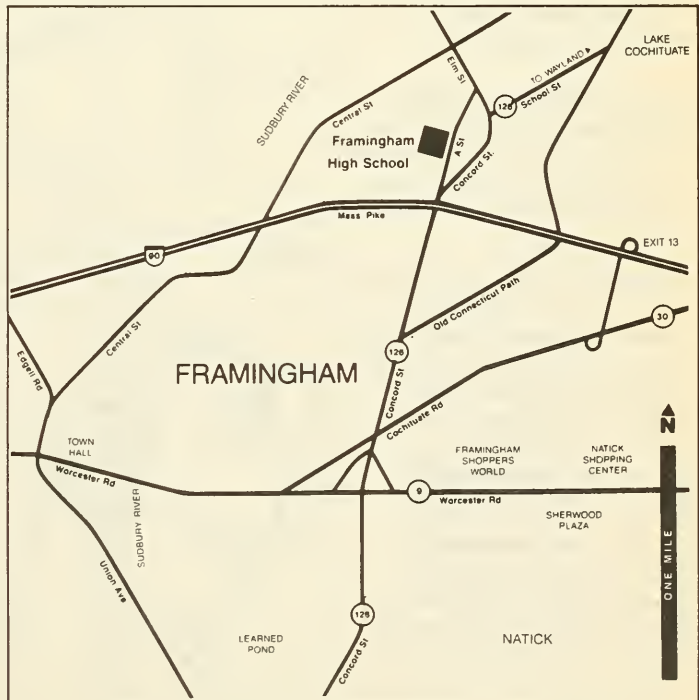
From Rte. 128 North, take Route 135 exit. Turn left at end of ramp and follow Common St. to campus.



Framingham High School

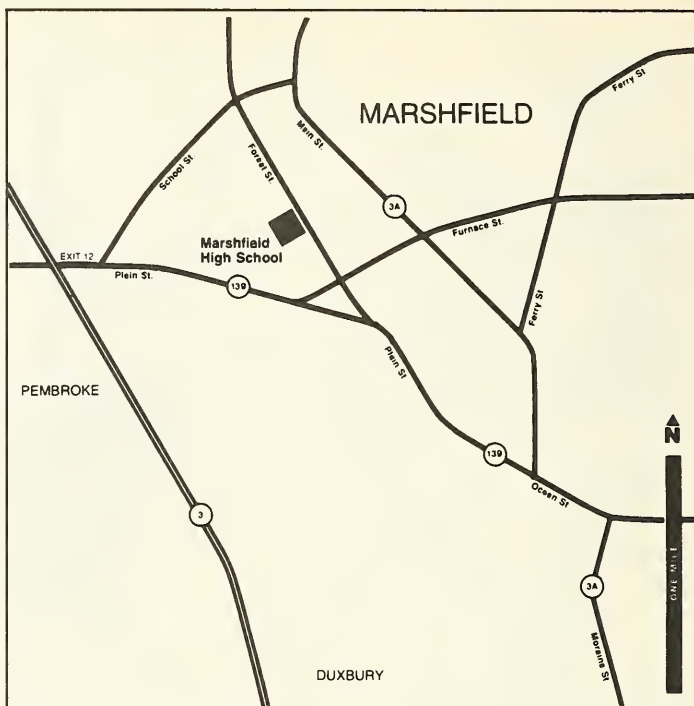
A Street

From Mass Pike going West, take Rte. 30 exit. Bear right after toll booth and take Rte. 30 West to Rte. 126 (Concord St.). Take right onto Rte. 126. Go under Mass. Pike to A Street (left at fork). High School on left.



Marshfield High School Forest Street

From Route 3, going North or South, take exit 12 and follow School St. to Forest St. Take a right onto Forest St. and the high school is located on the right just before you reach Furnace St.



Milford High School 31 West Fountain Street

1. From Mass Pike and Rte. 9 to 495 South, Exit 20 to Cedar St. to Dilla St. to Purchase St. to Fountain St. to West Fountain St. to Milford High School.

2. From Rte. 140 past Milford Hospital. Go 1 mile; pass Shaw's Supermarket and Hills Shopping Plaza. Take right at island and proceed across West St. to Highland St., 3/4 mile to overhead blinking light. Take right onto West Fountain St. to High School.

3. From Rte. 109 to intersection with Rte. 16. Proceed through Milford (approx. 3 miles to Milford Hospital and Rte. 140). Take right at Milford Hospital and proceed as in step #2.



Westwood High School

200 Nahatan Street

From Rte. 128 North take Rte. 109 Exit. Go west after exit on Rte. 109 to Nahatan St. on left. Take Nahatan St. to high school on left.

From Rte. 128 South take Rte. 109 Exit. Follow above directions on Rte. 109.



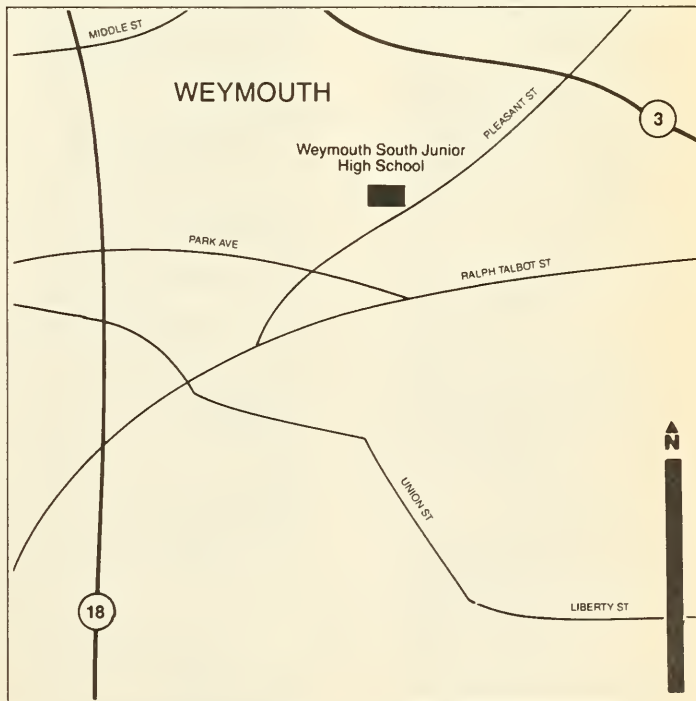
Weymouth Junior High School

360 Pleasant Street

From Rte. 3 Heading North. Take exit 16. At top of ramp take a left. Go up hill and continue through traffic lights. At next set of lights, turn left. Turn left again at next set of lights. South Junior High School is the second school you will see on your left.

From Rte. 3 Heading South. Take exit 16B. Proceed through traffic lights at top of hill. Take a left at next set of traffic lights. At next set of traffic lights turn left. South Junior High School is the second school on your left.

From Rte. 18 Heading North. Continue past Pleasant Shops and South Shore Hospital (both on your right). Take a right at the first set of traffic lights after the South Shore Hospital. At next set of traffic lights turn left. South Junior High School is the second school you will see on your left.



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Northeastern University is dedicated to providing a diverse student population with an academic program and a course of professional preparation of the highest quality. The University values equally knowledge for its own sake, knowledge as a means to success in the workplace, and knowledge as a cornerstone of personal achievement and satisfaction. As a private, urban university, Northeastern is determined to maintain its reputation as a friend to the city of Boston and a partner of the Commonwealth of Massachusetts.

The *Northeastern University University College Bulletin* contains the University's primary statements about these academic programs and degree [certificate] requirements, as authorized by the president or the Board of Trustees. For information about other academic policies and procedures; student responsibilities; student academic and cocurricular life; faculty rights and responsibilities; or general personnel policies, benefits, and services, please refer to the *Academic Operations Manual*, *Undergraduate and Graduate Student Handbook*, *Cooperative Education Handbook*, *Faculty Handbook*, *Benefits and Services Handbook*, and related procedural guides, as appropriate.

The *University College Bulletin* should be used in conjunction with the *Undergraduate Catalog*, *Undergraduate and Graduate Student Handbook*, *Cooperative Education Handbook*, and other procedural guides that contain Northeastern University's primary statements about academic programs, policies, and procedures; degree requirements; student responsibilities; student academic and cocurricular life; faculty rights and responsibilities; and general personnel policies, benefits, and services.

Accreditation

Northeastern University is accredited by the New England Association of Schools and Colleges, Inc., which accredits schools and colleges in the six New England states.

Accreditation by the Association indicates that the institution has been carefully evaluated and found to meet standards agreed upon by qualified educators. The undergraduate business programs offered by Northeastern University are accredited by the American Assembly of Collegiate Schools of Business.

Delivery of Services

Northeastern University assumes no liability for delay or failure to provide educational or other services or facilities due to causes beyond its reasonable control. Causes include, without limitation, power failure, fire, strikes by University employees or others, damage by natural elements, and acts of public authorities. The University will, however, exert reasonable efforts, when it judges them to be appropriate, to provide comparable services, facilities, or performance; but its inability or failure to do so shall not subject the University to liability.

The *Northeastern University Undergraduate Catalog* contains current information about the University calendar, admissions, degree requirements, fees, and regulations; however, such information is not intended and should not be regarded to be contractual.

Northeastern University reserves the sole right to promulgate and change rules and regulations and to make changes of any nature in its program; calendar; admissions policies, procedures, and standards; degree requirements; fees; and academic schedule whenever necessary or desirable, including, without limitation, changes in course content and class schedule, the cancellation of scheduled classes and other academic activities, and the substitution of alternatives for scheduled classes and other academic activities. In any such case, the University will give whatever notice is reasonably practical.

Northeastern University will endeavor to make available to its students a fine education and a stimulating and congenial environment. However, the quality and rate of progress of an individual's academic career and professional advancement upon completion of a degree or program are largely dependent on his or her own abilities, commitment, and effort. In many professions and occupations, there are also requirements imposed by federal and state statutes and regulatory agencies for certification or entry into a particular field. These requirements may change while a student is enrolled in a program and may vary from state to state or country to country. Although the University stands ready to help its students find out about requirements and changes in them, it is the student's responsibility to initiate the inquiry.

Disability Resource Center

The Disability Resource Center provides a variety of disability-related services and accommodations to Northeastern University's students and employees with disabilities.

Northeastern University's compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 are coordinated by the Dean and Director of the Disability Resource Center. Persons requiring information regarding the Disability Resource Center should contact Dean G. Ruth Bork at 617-373-2675 (voice) or 617-373-2730 (TTY).

Tuition and Fee Policy

Tuition rates, all fees, rules and regulations, and courses and course content are subject to revision by the president and the Board of Trustees at any time.

Emergency Closing of the University

Northeastern University has made arrangements to notify students, faculty, and staff by radio and television when it becomes necessary to cancel classes because of extremely inclement weather. AM stations WBZ (1030) and WRKO (680), and FM stations WBUR (90.9), WBMX (98.5), and WFNX (101.7) are the radio stations authorized to announce the University's decision to close. Television stations WBZ-TV4, WCVB-TV5, and WHDH-TV7 will also report cancellations. Since instructional television courses originate from live or broadcast facilities at the University, neither the classes nor the courier service operates when the University is closed. Please listen to the radio or television to determine whether the University will be closed.

If a storm occurs at night, the announcement of University closing is given to the radio stations at approximately 6:00 a.m. Classes are generally canceled for that entire day and evening at all campus locations unless stated otherwise. When a storm begins late in the day, cancellations of evening classes may be announced. This announcement is usually made between 2:00–3:00 p.m.

Equal Opportunity Policy

Northeastern University does not discriminate on the basis of race, color, religion, sex, sexual orientation, age, national origin, disability, or veteran status in admission to, access to, treatment in, or employment in its programs and activities. In addition, Northeastern University will not condone any form of sexual harassment. Handbooks containing the University's nondiscrimination policies and its grievance procedures are available in the Office of Affirmative Action, 175 Richards Hall. Inquiries regarding the University's nondiscrimination policies may be directed to:

Ellen S. Jackson, Dean/Director
Office of Affirmative Action
175 Richards Hall
Northeastern University
Boston, Massachusetts 02115
617-373-2133

Inquiries concerning the application of nondiscrimination policies may also be referred to the Regional Director, Office for Civil Rights, U.S. Department of Education, J. W. McCormack Building, Post Office Court House, Room 222, Boston, Massachusetts 02109-4557.

Family Educational Rights and Privacy Act

In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits its students to inspect their records wherever appropriate and to challenge specific parts of them when they feel it necessary to do so. Specific details of the law as it applies to the University are printed in the *Undergraduate and Graduate Student Handbook* and are distributed annually at registration for the University's colleges and graduate schools.

Tuition Default Policy

In cases where the student defaults on his/her tuition, the student shall be liable for the outstanding tuition and all reasonable associated collection costs incurred by the University, including attorneys' fees.

Notes

Useful Telephone Numbers

Academic Advising Services

Main Boston Campus,
Burlington 617-373-2400
TTY 617-373-2825

Downtown Boston Campus 617-373-8300

All branch locations 617-373-4291

e-mail: uc-academic-affairs@lynx.dac.neu.edu

Career Services

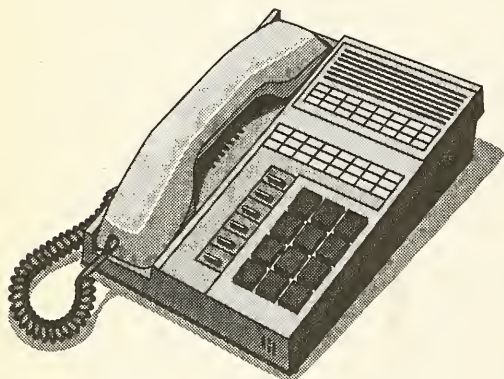
Career counseling
job search seminars
and support services
103 Stearns Center 617-373-2430
TTY 617-373-2432

<http://www.neu.edu/career-services>

Other Advising Services

Our advising services include educational and personal counseling and vocational testing.

Counseling Center
Room 302 Ell 617-373-2142



Main University 617-373-2000

Other Important Numbers

Bookstore (Main Boston Campus)
Ell Building 617-373-2286
Burlington Campus 617-272-1710

Bursar
Room 254 RI 617-373-2270
TTY 617-373-3881

Disability Resource Center
020 Dodge Hall 617-373-2675
TTY 617-373-2730

Financial Aid
Room 356 RI 617-373-3190
TTY 617-373-5714

Gym
Room 100 CB 617-373-4433
(part-time students may use many of the
gym facilities after 4:30 p.m.)
TTY 617-373-2773

International Student Office
Room 203 Ell 617-373-2310

Library
Circulation 617-373-2353
Hours (recorded message) 617-373-4976
TTY 617-373-3395

NU Events Hot Line 617-373-3281

Registrar
Room 120 HA 617-373-2300
TTY 617-373-5360

Transcripts
Room 117 HA 617-373-5411
University Police 617-373-3333
TTY 617-373-3934

Veterans' Services 617-373-2183

Program Offices

Business Administration
Room 270 RY 617-373-2418,
2419

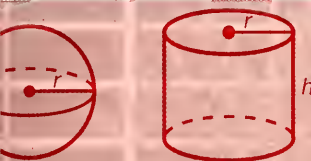
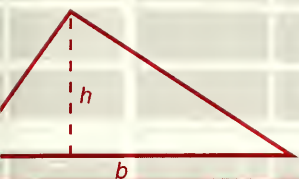
Criminal Justice and Security
Room 266 RY 617-373-2416,
2423

Health Professions and Sciences
Room 266 RY 617-373-5796

Liberal Arts
Room 266 RY 617-373-2416,
2423

Paramedic Technology 617-238-8400
Burlington Campus
Radiologic Technology 617-373-2818
Room 266 RY

<http://www.neu.edu/uc/>

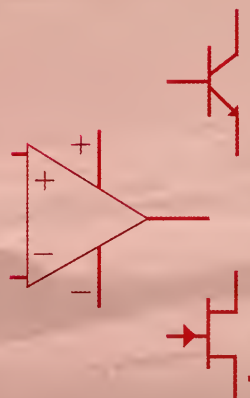


The Lowell Institute School at Northeastern

1996–1998 Bulletin

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

```
for (int i=0; i<100; i++)
```



**Northeastern
University**

**The Lowell Institute School
at Northeastern**

**A Division of the School of
Engineering Technology**

**Bulletin
1996–1998**

**120 Snell Engineering Center
Boston, Massachusetts 02115**

**Telephone: 617-373-2500
Fax: 617-373-2501
E-mail: info@lis.coe.neu.edu**

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About This Bulletin

This *Bulletin* offers information about the evening and weekend programs available at The Lowell Institute School at Northeastern University. (If you are interested in Northeastern University's full-time day programs, call the Office of Undergraduate Admissions, 617-373-2200.)

For prospective students, we hope that after reading this publication you'll agree that a career in engineering technology can be exciting and challenging. As you'll soon discover, our evening and weekend programs are designed to enable you to pursue a career and an education at the same time.

Students already attending The Lowell Institute School use the *Bulletin* as an important guide to the resources and policies of the University. In addition, students use the degree program descriptions to plan and track their academic careers.

The *Lowell Institute School Bulletin* is divided into two parts: "Teaching Tomorrow's Technologists Today" and "Northeastern University."

"Teaching Tomorrow's Technologists Today" defines engineering technology and introduces you to The Lowell Institute School. This section also contains descriptions of each program and course we offer.

The "Northeastern University" section reviews the benefits—the services and resources—that attending a large private university provides. We present the University's administrative and academic policies, as well as financial aid and scholarship opportunities.

Taking the Next Step

The evening and weekend technology programs have an open enrollment policy, so you can register for courses without formally applying for admittance to a program. In fact, our students earn sixteen credits before petitioning for entrance to a program. For more details, carefully review the "Admissions" section. (See page 61.)

A Fee Schedule and Academic Calendar should have been enclosed with this *Bulletin*. The insert includes the current academic calendar, registration dates, and a list of the University's fees.

Before registration begins, obtain a copy of the *University College and The Lowell Institute School Schedule* for the next academic quarter. The *Schedule* indicates which courses will be offered each quarter, as well as when and where they will meet. Note that, since not all courses are offered every quarter, you must plan your course load for the coming academic year, not just the next quarter, by referring to the program and course descriptions contained in this *Bulletin* and obtaining a copy of the *Tentative Part-Time Schedule* published annually. For more details, review the "Registration" section. (See page 63.)

Finding Additional Help

If you have any questions, or are missing any of the forms mentioned in this *Bulletin*, call The Lowell Institute School office, 617-373-2500, or e-mail info@lis.coe.neu.edu.

Teaching Tomorrow's Technologists Today

|



The Lowell Institute School at Northeastern

A Division of the School of Engineering Technology

What do you get when you merge a 93-year-old technical institution and a 70-year-old engineering technology school? The Lowell Institute School at Northeastern! The name may be new, but the quality is still the same, giving students the best of both worlds and three new certificate programs with credit toward degrees.

As a result of the merger, we have more course offerings as electives in the associate's and bachelor's degree programs as well as new certificate programs in computer technology, electronics technology, and graphics technology.

The Lowell Institute School at Northeastern offers students an engineering technology education with the emphasis on applications and problem solving. Industry demand for our graduates remains high, and The Lowell Institute School programs are designed to meet this demand. The current curriculum revisions, made in conjunction with our Industry Advisor Council, have fine tuned our already first-class programs. Our instructors are practitioners in the fields they teach, so they have the knowledge, not just "from the book" but through hands-on experience.

Lowell Institute School courses are available at our main Boston campus and at our two

suburban campuses in Burlington and Dedham. A selection of our courses is also available, via Network Northeastern's interactive television system, to both employees of subscribing companies and to students at our two suburban campuses.

At The Lowell Institute School at Northeastern, we offer you the opportunity to take everything from an individual course to brush up your skills, to certificates to jump start your career, to a bachelor's degree (and maybe beyond)! Courses are offered weekday evenings and Saturdays, both mornings and afternoons, to fit your busy schedule. The Lowell Institute School has an open admission policy: fill in the registration form, submit it via telephone, FAX, or mail, and you're on your way to a new, rewarding, and challenging career in engineering technology. Through a generous grant from the Lowell Foundation, financial assistance is available via the Lowell Scholar's Program.

For additional information about us, visit 120 Snell Engineering Center on our Boston campus, phone us at 617-373-2500, FAX us at 617-373-2501, or e-mail us at info@lis.coe.neu.edu.

An Introduction to Engineering Technology

What is engineering technology?

The following definition of engineering technology was established by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology and approved by the Engineering Technology Council of the American Society for Engineering Education: "Engineering technology is the profession in which a knowledge of mathematics and natural sciences gained by higher education, experience, and practice is devoted primarily to the implementation and extension of existing technology for the benefit of humanity. Engineering technology education focuses primarily on the applied aspects of science and engineering aimed at preparing graduates for practice in that portion of the technological spectrum closest to product improvement, manufacturing, construction, and engineering operational functions." Thus engineering technology is the application of engineering principles and modern technology to help solve or prevent technical problems.

Engineering technology is a relatively new discipline. Before engineering technology programs like Northeastern's emerged, people with scientific or technical ambitions had a difficult decision to make: what kind of education should they pursue? College-bound students had three choices.

Choice number one was selecting a major from among the pure sciences: physics, chemistry, or biology. However, these majors are appropriate only for people interested in pursuing additional degrees, laboratory research, or careers in education.

The second choice was selecting from among the engineering science majors: civil engineering, electrical engineering, or mechanical engineering. But engineering requires highly developed analytical skills and prepares people for careers conceptualizing and designing technical devices or systems.

The third choice was deciding not to attend college, but to enroll in a technical or vocational school. This route is best suited for people interested in the trades; that is, for people who want careers physically building or repairing machinery.

Engineering technology curricula introduced a fourth option. The programs are designed to meet the growing need created by the technological revolution for college-educated problem solvers who can support the engineering process by bridging the gap between the blueprints and the production line. These men and women can help engineers and tradespeople work effectively together.

Engineering technology programs include scientific and engineering principles relevant to your chosen field: you will come to understand why a system is designed in a particular fashion and how it works. This educational focus is often absent from a technical or vocational school education.

In addition, engineering technology students acquire hands-on technical skills that enable them to solve production and system implementation problems and help them explain solutions to tradespeople.

Who are engineering technologists?

People who are part of the technology workplace include scientists, engineers, technologists, technicians, and tradespeople. All these people have specialized education or training beyond the high-school level and often work together as a team. As on any team, the players have different but important roles.

Scientists are concerned with advancing our understanding of the laws of nature and our knowledge of scientific principles. The scientist is primarily involved in research.

Engineers employ the scientific knowledge developed by scientists in planning, designing, and constructing technical devices and systems. The engineer is a developer of technological innovations.

Engineering technologists work closely with engineers in coordinating people, material, and machinery to achieve the specific goals of a particular project. The engineering technologist often ensures that the engineer's designs and instructions are implemented efficiently and according to accepted practices.

Program Descriptions

Overview

This section gives a description of each program offered by The Lowell Institute School. Accompanying each description are specimen curricula for the majors offered within the specific program. The specimens list the degree's required courses and the sequence in which you should complete them. The specimens assume that you will initially enroll in courses during the fall quarter. If you are a transfer student, take time

off, or begin the program in a different quarter, please meet with one of our academic advisers. The adviser will help you take courses in a sequence that is academically sound and that will fulfill your degree program's graduation requirements. For more information about the program descriptions and curricula, contact an adviser at 617-373-2500.

Civil Engineering Technology Programs

Civil engineering professionals plan and construct a variety of structures and public works. The civil engineering technologist's major functions as a member of the technical team include preparing surveys (topographical, geological, traffic), designing structures (buildings, bridges, dams), planning municipal systems (water, sewers, flood control), and developing transportation facilities (highways, railways, waterways).

We offer associate's degree programs with majors in environmental engineering technology, structural engineering technology, and surveying and highway engineering technology.

The associate's degree program in environmental engineering technology offers you the opportunity to prepare for responsibilities related to designing, constructing, and supervising municipal plants and systems that control the storage and distribution of water. Students may also prepare for responsibilities associated with the disposal of sewage and waste in urban areas, with an emphasis on preventing contamination and pollution. Career opportunities are with town, city, and state public works depart-

ments, private engineering consultants, architects, contractors, and engineering firms.

The associate's degree program in structural engineering technology offers the opportunity to prepare for planning, designing, and supervising the construction of buildings, bridges, foundations, flood-control projects, and other fixed structures. Professional opportunities include consulting engineering firms, architectural groups, contractors, railroads, government agencies, and the military.

The associate's degree program in surveying and highway engineering technology offers opportunities in the preparation and calculation of preliminary and legal surveys required for both basic and complex projects. These projects can include subdivision work, individual lot layouts, highway layouts, and projects relating to sewer systems, pipelines, power transmission lines, dams, reservoirs, and aqueducts. Career opportunities are with independent surveying companies, civil engineering companies, highway transit, railroad planning groups, cartographers, construction companies, and contractors.

Environmental Engineering Technology

(Major Code 011)

The Environmental Engineering Technology program leads to the associate in engineering degree. Degree candidates must

earn 103 credits by completing the following four-year curriculum.

First-Year Courses	<i>Fall</i>	GET	4170	Engineering Graphics 1
		MTH	4107	College Algebra
	<i>Winter</i>	GET	4171	Engineering Graphics 2
		MTH	4108	Pre-Calculus
	<i>Spring</i>	GET	4100	Computer Programming for Engineering Technology
		MTH	4120	Calculus 1
Second-Year Courses	<i>Fall</i>	MTH	4121	Calculus 2
		PHY	4117	Physics 1
		PHY	4196	Physics Lab 1
	<i>Winter</i>	ENG	4100	Critical Writing 1
		PHY	4118	Physics 2
		PHY	4197	Physics Lab 2
	<i>Spring</i>	GET	4306	Technical Communications
		PHY	4119	Physics 3
		PHY	4198	Physics Lab 3
Third-Year Courses	<i>Fall</i>	CHM	4130	Chemical Principles 1
		ECN	4115	Economic Principles and Problems 1
		MET	4301	Mechanics A
	<i>Winter</i>	ECN	4116	Economic Principles and Problems 2
		ENG	4111	Critical Writing 2
		MET	4314	Stress Analysis A
	<i>Spring</i>	MET	4315	Stress Analysis B
		MET	4370	Fluid Mechanics A
Fourth-Year Courses	<i>Fall</i>	CET	4324	Structural Analysis 1
		CET	4393	Construction Administration
	<i>Winter</i>	CET	4350	Environmental 1
		CET	4371	Concrete Design 1
	<i>Spring</i>	CET	4351	Environmental 2
		CET	4361	Materials and Soil Mechanics

Structural Engineering Technology

(Major Code 012)

The Structural Engineering Technology program leads to the associate in engineering degree.

Degree candidates must earn 103 credits by completing the following four-year curriculum.

First-Year Courses	<i>Fall</i>	GET	4170	Engineering Graphics 1
		MTH	4107	College Algebra
	<i>Winter</i>	GET	4171	Engineering Graphics 2
		MTH	4108	Pre-Calculus
	<i>Spring</i>	GET	4100	Computer Programming for Engineering Technology
		MTH	4120	Calculus 1
Second-Year Courses	<i>Fall</i>	MTH	4121	Calculus 2
		PHY	4117	Physics 1
		PHY	4196	Physics Lab 1
	<i>Winter</i>	ENG	4100	Critical Writing 1
		PHY	4118	Physics 2
		PHY	4197	Physics Lab 2
	<i>Spring</i>	GET	4306	Technical Communications
		PHY	4119	Physics 3
		PHY	4198	Physics Lab 3
Third-Year Courses	<i>Fall</i>	CHM	4130	Chemical Principles 1
		ECN	4115	Economic Principles and Problems 1
		MET	4301	Mechanics A
	<i>Winter</i>	ECN	4116	Economic Principles and Problems 2
		ENG	4111	Critical Writing 2
		MET	4314	Stress Analysis A
	<i>Spring</i>	CET	4321	Introduction to Structural Design
		MET	4315	Stress Analysis B
Fourth-Year Courses	<i>Fall</i>	CET	4324	Structural Analysis 1
		CET	4331	Steel Design 1
	<i>Winter</i>	CET	4325	Structural Analysis 2
		CET	4371	Concrete Design 1
	<i>Spring</i>	CET	4361	Materials and Soil Mechanics
		CET	4393	Construction Administration

Surveying and Highway Engineering Technology (Major Code 013)

The Surveying and Highway Engineering Technology program leads to the associate in engineering degree. Degree candidates must

earn 103 credits by completing the following four-year curriculum.

First-Year Courses

<i>Fall</i>	GET	4170	Engineering Graphics 1
	MTH	4107	College Algebra
<i>Winter</i>	GET	4171	Engineering Graphics 2
	MTH	4108	Pre-Calculus
<i>Spring</i>	GET	4100	Computer Programming for Engineering Technology
	MTH	4120	Calculus 1

Second-Year Courses

<i>Fall</i>	MTH	4121	Calculus 2
	PHY	4117	Physics 1
	PHY	4196	Physics Lab 1
<i>Winter</i>	ENG	4100	Critical Writing 1
	PHY	4118	Physics 2
	PHY	4197	Physics Lab 2
<i>Spring</i>	GET	4306	Technical Communications
	PHY	4119	Physics 3
	PHY	4198	Physics Lab 3

Third-Year Courses

<i>Fall</i>	CHM	4130	Chemical Principles 1
	ECN	4115	Economic Principles and Problems 1
	MET	4301	Mechanics A
<i>Winter</i>	ECN	4116	Economic Principles and Problems 2
	ENG	4111	Critical Writing 2
	MET	4314	Stress Analysis A
<i>Spring</i>	MET	4315	Stress Analysis B
	MET	4370	Fluid Mechanics A

Fourth-Year Courses

<i>Fall</i>	CET	4301	Plane Surveying
	CET	4316	Land Use Planning
<i>Winter</i>	CET	4302	Geodetic Surveying
	CET	4307	Legal Aspects of Surveying
<i>Spring</i>	CET	4303	Route Surveying
	CET	4311	Highway Engineering

Computer Technology Programs

The work of the computer technology professional relates to the design and use of computer system hardware and software. Areas of study include the design and architecture of the computer system, the methodology and application of problem solving, and the utilization of hardware.

We offer both an associate's and a bachelor's degree program in computer technology.

The associate's degree program in computer technology offers you the opportunity to understand the mathematical and technological foundations of both hardware and software. In addition to providing a more thorough

study of hardware and software, the bachelor's degree program gives you the opportunity to specialize in a specific area through five required technical electives.

Career opportunities may include computer programming for engineering, science, and business. Additional employment opportunities concern designing, engineering, and testing computers, and interfacing computers with various types of equipment used in automation. Associate's degree graduates may qualify for entry-level positions in the areas listed, while bachelor's degree graduates may secure employment with more responsibility.

Computer Technology (Major Code 036)

The Computer Technology program leads to the associate in engineering degree. Degree candi-

dates must earn 104 credits by completing the following four-year curriculum.

First-Year Courses	<i>Fall</i>	GET	4105	Computer Applications for Technology
		MTH	4107	College Algebra
	<i>Winter</i>	GET	4170	Engineering Graphics 1
		MTH	4108	Pre-Calculus
	<i>Spring</i>	GET	4102	Introduction to Engineering Technology
		GET	4171	Engineering Graphics 2
Second-Year Courses	<i>Fall</i>	MTH	4120	Calculus 1
		ENG	4100	Critical Writing 1
	<i>Winter</i>	MTH	4121	Calculus 2
		PHY	4117	Physics 1
		PHY	4196	Physics Lab 1
	<i>Spring</i>	MTH	4196	Math for Engineering Technology
		PHY	4118	Physics 2
		PHY	4197	Physics Lab 2
Third-Year Courses	<i>Fall</i>	EET	4151	Circuit Analysis 1
		PHY	4119	Physics 3
		PHY	4198	Physics Lab 3
	<i>Winter</i>	CT	4150	Computer Organization
		EET	4152	Circuit Analysis 2
		ENG	4111	Critical Writing 2
	<i>Spring</i>	GET	4100	Computer Programming
		GET	4306	Technical Communications
Fourth-Year Courses	<i>Fall</i>	CT	4311	Programming with C++ Language
		EET	4311	Digital Electronics 1
		()		Social Science/Humanities Elective
	<i>Winter</i>	CT	4330	Data Structures
		CT	4345	Assembly Language
		CT	4346	Assembly Language Lab
	<i>Spring</i>	CT	4374	Introduction to CPU Hardware
		()		Social Science/Humanities Elective

Computer Technology (Major Code 037)

The Computer Technology program leads to the bachelor of science in engineering technology degree. Degree candidates must earn at least

185 credits by completing the following seven-year curriculum.

First-Year Courses	<i>Fall</i>	GET	4105	Computer Applications for Technology
		MTH	4107	College Algebra
	<i>Winter</i>	GET	4170	Engineering Graphics 1
		MTH	4108	Pre-Calculus
	<i>Spring</i>	GET	4102	Introduction to Engineering Technology
		GET	4171	Engineering Graphics 2
Second-Year Courses	<i>Fall</i>	MTH	4120	Calculus 1
		ENG	4100	Critical Writing 1
	<i>Winter</i>	MTH	4121	Calculus 2
		PHY	4117	Physics 1
		PHY	4196	Physics Lab 1
	<i>Spring</i>	MTH	4196	Math for Engineering Technology
		PHY	4118	Physics 2
		PHY	4197	Physics Lab 2
Third-Year Courses	<i>Fall</i>	EET	4151	Circuit Analysis 1
		PHY	4119	Physics 3
		PHY	4198	Physics Lab 3
	<i>Winter</i>	CT	4150	Computer Organization
		EET	4152	Circuit Analysis 2
		ENG	4111	Critical Writing 2
	<i>Spring</i>	ECN	4115	Economic Principles and Problems 1
		GET	4100	Computer Programming
		GET	4306	Technical Communications
Fourth-Year Courses	<i>Fall</i>	CT	4311	Programming with the C++ Language
		EET	4311	Digital Electronics 1
		()		Social Science/Humanities Elective
	<i>Winter</i>	CT	4330	Data Structures
		CT	4345	Assembly Language
		CT	4346	Assembly Language Lab
	<i>Spring</i>	CT	4374	Introduction to CPU Hardware
		CT	4381	Operating Systems
		()		Social Science/Humanities Elective

Fifth-Year Courses

<i>Fall</i>	CT	4335	Numerical Methods
	CT	4375	CPU Architecture
	CMN ()		Communication Elective
<i>Winter</i>	CT	4355	Micro Peripheral Hardware
	()		Social Science/Humanities Elective
<i>Spring</i>	CT	4340	Software Engineering Design
	CT	4380	Data Communication Methods

Sixth-Year Courses

<i>Fall</i>	CT	4356	Complex Peripheral Hardware
	CT	4370	Computer Lab 1
	CT	4480	Local Area Networks 1
<i>Winter</i>	CT	4351	Advanced Computer Organization
	()		Social Science/Humanities Elective
<i>Spring</i>	CT	4360	Industry Software
	CT	4371	Computer Lab 2
	()		Social Science/Humanities Elective

Seventh-Year Courses

<i>Fall</i>	CT	4369	Digital Electronics Design
	()		Technical Elective
<i>Winter</i>	CT	4365	Industry Hardware
	CT	4372	Computer Lab 3
	()		Social Science/Humanities Elective
<i>Spring</i>	()		Social Science/Humanities Elective
	()		Technical Elective

Suggested Technical Electives

CT	4348	LISP
CT	4377	VLSI Design
CT	4382	Computer Graphics Programming
CT	4383	Databases
CT	4387	Bit Slice Microcomputers
CT	4389	Single-Chip Microprocessors
CT	4390	Special Problems in Computer Technology
CT	4393	UNIX Operating System
CT	4394	Object-Oriented Programming
CT	4395	Computer Security
CT	4397	Advanced UNIX Programming
CT	4470	Introduction to X Windows
CT	4475	Concurrent Engineering and Design Testability
CT	4481	Local Area Networks 2

*Open Elective can be a three or four quarter-hour course.

Electrical Engineering Technology Programs

Electrical engineering technologists consider the design and operation of equipment and systems related to communications, data processing, electrical control, and power. In the power utility field, for example, the electrical engineering technologist is responsible for the generation, transmission, and distribution of electricity for light and power.

We offer both an associate's and a bachelor's degree program in electrical engineering technology.

The associate's degree program in electrical engineering technology relates to the design, development, and operation of communications, data processing, and electronic control equipment. The equipment is applied to computers, military and space explorations, and automated industrial production. The bachelor's degree

program, in addition, relates to the installation and production of a variety of electrical and electronic equipment. Fields in which such equipment is applied include communications, data processing, industry, and in generating and utilizing electricity.

Career opportunities for associate's degree graduates include entry-level positions related to communications and electrical equipment, equipment manufacturing, and data processing and control. Career opportunities for bachelor's degree graduates are in public and private research laboratories; engineering consulting firms specializing in industrial and plant applications; electric utilities; and organizations concerned with the operation, manufacture, installation, or sale of electrical or electronic systems and equipment.

Electrical Engineering Technology

(Major Code 033)

The Electrical Engineering Technology program leads to the associate in engineering degree. The program is accredited by the Technology Accreditation Commission of the Accreditation

Board for Engineering and Technology. Degree candidates must earn at least 109 credits by completing the following four-year curriculum.

First-Year Courses	<i>Fall</i>	GET	4105	Computer Applications for Technology
		MTH	4107	College Algebra
	<i>Winter</i>	GET	4170	Engineering Graphics 1
		MTH	4108	Pre-Calculus
	<i>Spring</i>	GET	4102	Introduction to Engineering Technology
		GET	4171	Engineering Graphics 2
Second-Year Courses	<i>Fall</i>	GET	4100	Computer Programming
		MTH	4120	Calculus 1
		ENG	4100	Critical Writing 1
	<i>Winter</i>	MTH	4121	Calculus 2
		PHY	4117	Physics 1
		PHY	4196	Physics Lab 1
	<i>Spring</i>	MTH	4196	Math for Engineering Technology
		PHY	4118	Physics 2
		PHY	4197	Physics Lab 2
Third-Year Courses	<i>Fall</i>	EET	4151	Circuit Analysis 1
		PHY	4119	Physics 3
		PHY	4198	Physics Lab 3
	<i>Winter</i>	EET	4124	Circuits Lab 1
		EET	4152	Circuit Analysis 2
		()		Social Science/Humanities Elective
	<i>Spring</i>	EET	4125	Circuits Lab 2
		ENG	4111	Critical Writing 2
		GET	4306	Technical Communications
Fourth-Year Courses	<i>Fall</i>	EET	4311	Digital Electronics 1
		EET	4353	Circuit Analysis 3*
		()		Social Science/Humanities Elective
	<i>Winter</i>	EET	4312	Analog Electronics 1
		EET	4354	Circuit Analysis 4*
	<i>Spring</i>	EET	4310	Electrical Measurements
		EET	4313	Analog Electronics 2
		EET	4323	Electronics Lab

*Students not planning to enter a bachelor's degree program after graduation may substitute a social science/humanities elective for MTH 4123 Differential Equations, EET 4311 Digital Electronics 1 for EET 4353 Circuit Analysis 3, and an approved technical elective for EET 4354 Circuit Analysis 4.

Electrical Engineering Technology

(Major Code 035)

The Electrical Engineering Technology program leads to the bachelor of science in engineering technology degree. The program is accredited by the Technology Accreditation Commission of

the Accreditation Board for Engineering and Technology. Degree candidates must earn at least 188 credits by completing the following seven-year curriculum.

First-Year Courses	<i>Fall</i>	GET	4105	Computer Applications for Technology
		MTH	4107	College Algebra
	<i>Winter</i>	GET	4170	Engineering Graphics 1
		MTH	4108	Pre-Calculus
	<i>Spring</i>	GET	4102	Introduction to Engineering Technology
		GET	4171	Engineering Graphics 2
Second-Year Courses	<i>Fall</i>	MTH	4120	Calculus 1
		ENG	4100	Critical Writing 1
	<i>Winter</i>	MTH	4121	Calculus 2
		PHY	4117	Physics 1
		PHY	4196	Physics Lab 1
	<i>Spring</i>	MTH	4196	Math for Engineering Technology
		PHY	4118	Physics 2
		PHY	4197	Physics Lab 2
Third-Year Courses	<i>Fall</i>	EET	4151	Circuit Analysis 1
		ENG	4111	Critical Writing 2
		PHY	4119	Physics 3
		PHY	4198	Physics Lab 3
	<i>Winter</i>	EET	4124	Circuits Lab 1
		EET	4152	Circuit Analysis 2
		MTH	4123	Differential Equations
	<i>Spring</i>	EET	4125	Circuits Lab 2
		GET	4100	Computer Programming
		GET	4306	Technical Communications
Fourth-Year Courses	<i>Fall</i>	EET	4311	Electronics 1
		EET	4353	Circuit Analysis 3
		()		Social Science/Humanities Elective
	<i>Winter</i>	EET	4312	Electronics 2
		EET	4354	Circuit Analysis 4
		()		Social Science/Humanities Elective
	<i>Spring</i>	EET	4310	Electrical Measurements
		EET	4313	Analog Electronics 2
		EET	4323	Electronics Lab

Fifth-Year Courses

<i>Fall</i>	EET	4314	Digital Electronics 2
	EET	4327	Advanced Electronics Lab 1
	CMN	()	Communication Elective
<i>Winter</i>	EET	4328	Advanced Electronics Lab 2
	CMN	()	Communication Elective
	EET	()	Technical Elective
<i>Spring</i>	EET	4329	Advanced Electronics Lab 3
	EET	4330	Energy Conversion
	MET	4319	Mechanics

Sixth-Year Courses

<i>Fall</i>	EET	4370	Digital Computers 1
	()		Social Science/Humanities Elective
<i>Winter</i>	EET	4371	Digital Computers 2
	()		Social Science/Humanities Elective
<i>Spring</i>	EET	4337	Distributed Systems
	EET	()	Technical Elective

Seventh-Year Courses

<i>Fall</i>	EET	()	Technical Elective
	()		Social Science/Humanities Elective
<i>Winter</i>	EET	4377	Control Engineering 1
	EET	()	Technical Elective
	()		Social Science/Humanities Elective
<i>Spring</i>	EET	4378	Control Engineering 2
	()		Social Science/Humanities Elective

Suggested Technical Electives

CT	4311	Programming with the C++ Language
CT	4374	Introduction to CPU Hardware
CT	4375	CPU Architecture
CT	4475	Concurrent Engineering and Design Testability
EET	4315	Digital Electronics 3
EET	4317	Principles of Communication Systems 1
EET	4318	Principles of Communication Systems 2
EET	4319	Principles of Communication Systems 3
EET	4360	Photovoltaic Technology
EET	4362	Basic Power Systems 1
EET	4363	Basic Power Systems 2
EET	4364	Basic Power Systems 3
EET	4391	Basic Optics and Optical Systems Design
EET	4392	Optoelectronics and Fiber Optics
EET	4393	Applied Wave Optics
GET	4356	Engineering Economy
GET	4393	Engineering Probability and Statistics
MET	4340	Thermodynamics A
MET	4380	Materials A

Mechanical Engineering Technology Programs

Mechanical engineering technologists harness power resources that help machinery perform useful tasks. In contrast to civil engineering, which deals primarily with static forces and structures, mechanical engineering is concerned with the motion and kinetics of devices that are activated by hydraulic, electrical, mechanical, and thermodynamic forces.

We offer both an associate's and a bachelor's degree program in mechanical engineering technology (MET). A bachelor's degree program in aerospace maintenance engineering technology is also offered.

The associate's degree offers you the opportunity to prepare to be an entry-level technician in designing, producing, and installing mechanical tools, machinery, engines, and transportation equipment. The bachelor's degree focuses on designing, developing, operating, and installing equipment that involves interactions of mechanical, hydraulic, and thermodynamic systems. The equipment may include machinery, engines, boilers, furnaces, air-conditioning systems, heating systems, and transportation.

Graduates of the associate's degree program in MET may find entry-level career opportunities in almost any industry or engineering organization.

The mechanical engineering technology field provides opportunities for people with a broad range of interests, motivations, and abilities. For example, as a graduate working in the materials area you might be involved in specifying materials for a particular application; determining the cause of failures in the field; dealing with corrosion problems and corrosion prevention; and working with the manufacture and production of materials, or their sales and delivery.

Manufacturing attracts many MET graduates. As a tool designer, you might design a fixture for holding parts as they are manufactured. As a manufacturing technologist, you might specify how a complicated part is made, which proce-

dures will come first, and the cost of the operation. You might determine which machines are required to make a certain part. Or, you might program computerized numerical control (CNC) machines or robots, devise efficient material-handling schemes, and plan the flow of materials from raw stock to finished product.

Another area in the field is mechanical design. At a technician level a designer needs basic graphics skills and will typically work on a computer graphics terminal. Such people generally have excellent drafting skills. Designers, whether technicians or technologists, also need to understand material properties and manufacturing processes, so that designs use materials effectively and can be manufactured efficiently.

Design analysis, another popular career focus, is the proper sizing and shaping of materials based on their function (that is, the loads they must carry, the operating environment, and other service conditions). The designer may work on airplanes, ships, engines, oil well drilling or pumping equipment, toys, medical equipment, food processing equipment—the possibilities are endless.

Another career option is plant or building management, which involves heating, ventilation, air-conditioning, water, lighting, plumbing, and electrical power requirements. Career opportunities also exist in product or system operation, testing, and technical sales.

The bachelor's degree program in aerospace engineering technology offers preparation for designing, developing, operating, installing, and producing aircraft and aircraft component systems. Career opportunities are available in technical, support, and management positions within the aircraft industry. Additional opportunities may be found within engineering teams that manufacture aircraft or spacecraft components, and among design/application positions in both the civilian and military aerospace markets.

Mechanical Engineering Technology

(Major Code 021)

The Mechanical Engineering Technology program leads to the associate in engineering degree. The program is accredited by the Technology Accreditation Commission of the

Accreditation Board for Engineering and Technology. Degree candidates must earn 107 credits by completing the following four-year curriculum.

First-Year Courses	<i>Fall</i>	GET	4105	Introduction to Computers
		MTH	4107	College Algebra
	<i>Winter</i>	GET	4170	Engineering Graphics 1
		MTH	4108	Pre-Calculus
	<i>Spring</i>	GET	4102	Introduction to Engineering Technology
		GET	4171	Engineering Graphics 2
Second-Year Courses	<i>Fall</i>	ENG	4100	Critical Writing 1
		MTH	4120	Calculus 1
	<i>Winter</i>	MTH	4121	Calculus 2
		PHY	4117	Physics 1
		PHY	4196	Physics Lab 1
	<i>Spring</i>	MTH	4196	Math for Engineering Technology
		PHY	4118	Physics 2
		PHY	4197	Physics Lab 2
Third-Year Courses	<i>Fall</i>	EET	4320	Electricity and Electronics
		PHY	4198	Physics Lab 3
		MET	4301	Mechanics A
	<i>Winter</i>	MET	4380	Materials A
		MET	4302	Mechanics B
	<i>Spring</i>	GET	4104	Introduction to Product Design
		MET	4314	Stress Analysis A
Fourth-Year Courses	<i>Fall</i>	MET	4388	Measurement and Analysis
		ENG	4111	Critical Writing 2
		ECN	4115	Economic Principles and Problems
	<i>Winter</i>	MET	4340	Thermodynamics A
		MET	4373	Fluid Mechanics
		MET	4392	Fluid Mechanics Laboratory*
	<i>Spring</i>	GET	4200	Visual Basic Programming
		GET	4306	Technical Communications
		()		Social Science/Humanities Elective

*MET 4391 Mechanics Laboratory or MET 4393 Thermal Analysis Laboratory may be substituted for MET 4392 Fluid Mechanics Laboratory.

Mechanical Engineering Technology

(Major Code 023)

The Mechanical Engineering Technology program leads to the bachelor of science in engineering technology degree. The program is accredited by the Technology Accreditation

Commission of the Accreditation Board for Engineering and Technology. Degree candidates must earn 189 credits by completing the following seven-year curriculum.

First-Year Courses

<i>Fall</i>	GET	4105	Introduction to Computers
	MTH	4107	College Algebra
<i>Winter</i>	GET	4170	Engineering Graphics 1
	MTH	4108	Pre-Calculus
<i>Spring</i>	GET	4171	Engineering Graphics 2
	GET	4102	Introduction to Engineering Technology

Second-Year Courses

<i>Fall</i>	MTH	4120	Calculus 1
	ENG	4100	Critical Writing 1
<i>Winter</i>	MTH	4121	Calculus 2
	PHY	4117	Physics 1
	PHY	4196	Physics Lab 1
<i>Spring</i>	MTH	4196	Math for Engineering Technology
	PHY	4118	Physics 2
	PHY	4197	Physics Lab 2

Third-Year Courses

<i>Fall</i>	EET	4320	Electricity and Electronics
	PHY	4198	Physics Lab 3
	MET	4301	Mechanics A
<i>Winter</i>	MET	4380	Materials A
	MET	4302	Mechanics B
<i>Spring</i>	GET	4104	Introduction to Product Design
	MET	4314	Stress Analysis A

Fourth-Year Courses

<i>Fall</i>	MET	4388	Measurement and Analysis
	ENG	4111	Critical Writing 2
	ECN	4115	Economic Principles and Problems 1
<i>Winter</i>	MET	4340	Thermodynamics A
	MET	4373	Fluid Mechanics
	MET	4392	Fluid Mechanics Laboratory
<i>Spring</i>	GET	4200	Visual Basic Programming
	GET	4306	Technical Communications
	()		Social Science/Humanities Elective

Fifth-Year Courses

<i>Fall</i>	CHM	4130	Chemical Principles 1
	MET	4315	Stress Analysis B
	MET	4391	Mechanics Laboratory
<i>Winter</i>	MET	4303	Mechanics C
	MET	4341	Thermodynamics B
	MET	4393	Thermal Analysis Laboratory
<i>Spring</i>	MET	4343	Heat Transfer
	()		Technical Elective
	()		Basic Science Elective*

Sixth-Year Courses

<i>Fall</i>	()		Technical Elective
	()		Communications Elective
	()		Social Science/Humanities Elective
<i>Winter</i>	GET	4356	Engineering Economy
	MET	4330	Mechanical Design A
	()		Social Science/Humanities Elective
<i>Spring</i>	MET	4331	Mechanical Design B
	MET	4395	Design Laboratory
	()		Social Science/Humanities Elective

Seventh-Year Courses

<i>Fall</i>	()		Technical Elective
	()		Social Science/Humanities Elective
<i>Winter</i>	()		Technical Elective
	()		Communications Elective
<i>Spring</i>	()		Technical Elective
	()		Social Science/Humanities Elective

Suggested Technical Electives

MET	4414	Mechanical Vibrations
MET	4416	Stress Analysis C
MET	4444	Power Generation
MET	4482	Applied Metallurgy
MET	4342	Refrigeration and Air Conditioning
MET	4152	Circuit Analysis 2
EET	4324	Circuit Analysis Lab 1
EET	4325	Circuit Analysis Lab 2
EET	4311	Digital Electronics 1
EET	4312	Analog Electronics 1
GET	4100	Computer Programming
GET	4364	Kinematics
MET	4481	Materials

Also, all other MFG courses offered in the evening (part-time) manufacturing curriculum.

*Basic Science Elective may be chosen from one of the following:

BIO	4103	Biology
CHM	4105	Chemistry and the Environment
CHM	4131	Chemical Principles 2
PHY	4119	Physics 3
ESC	4204	Physical Geology
ESC	4221	Environmental Geophysics

Mechanical Engineering Technology with a Concentration in Manufacturing

Manufacturing systems require interactions between machines and people. Manufacturing engineering technology is concerned with the design and use of manufacturing systems in the industrial environment.

We offer both an associate's and a bachelor's degree program in mechanical engineering technology with a concentration in manufacturing.

These degree programs offer you the opportunity to become familiar with the machines, materials, and processes used in manufacturing. The programs emphasize the emerging use of

computers without sacrificing attention to traditional areas of mechanical/manufacturing education. Areas addressed in the programs include materials and processes, computer-aided manufacturing, numerical control, and robotics. The core courses, combined with hands-on laboratory experiences, enable you to develop the skills required to work in manufacturing. Career opportunities are within various manufacturing industries, such as aircraft or electronics manufacturing.

Mechanical Engineering Technology with a Concentration in Manufacturing

(Major Code 055)

The Mechanical Engineering Technology with a Concentration in Manufacturing program leads to an associate in engineering degree.

Degree candidates must earn 104 credits by completing the following four-year curriculum.

First-Year Courses

<i>Fall</i>	GET	4105	Introduction to Computers
	MTH	4107	College Algebra
<i>Winter</i>	GET	4170	Engineering Graphics 1
	MTH	4108	Pre-Calculus
<i>Spring</i>	GET	4171	Engineering Graphics 2
	GET	4102	Introduction to Engineering Technology

Second-Year Courses

<i>Fall</i>	MTH	4120	Calculus 1
	ENG	4100	Critical Writing 1
<i>Winter</i>	MTH	4121	Calculus 2
	PHY	4117	Physics 1
	PHY	4196	Physics Lab 1
<i>Spring</i>	MTH	4196	Math for Engineering Technology
	PHY	4118	Physics 2
	PHY	4197	Physics Lab 2

Third-Year Courses

<i>Fall</i>	EET	4320	Electricity and Electronics
	PHY	4198	Physics Lab 3
	MET	4301	Mechanics A
<i>Winter</i>	MET	4380	Materials A
	MET	4302	Mechanics B
<i>Spring</i>	GET	4104	Introduction to Product Design
	MFG	4321	Computer-Aided Manufacturing 1

Fourth-Year Courses

<i>Fall</i>	MET	4388	Measurements and Analysis
	ENG	4111	Critical Writing 2
	MFG	4322	Computer-Aided Manufacturing 2
<i>Winter</i>	ECN	4115	Economic Principles and Problems 1
	GET	4200	Visual Basic Programming
<i>Spring</i>	MFG	4331	Computer Methods in Manufacturing 1
	GET	4306	Technical Communications
	()		Social Science/Humanities Elective

Mechanical Engineering Technology with a Concentration in Manufacturing

(Major Code 056)

The Mechanical Engineering Technology with a Concentration in Manufacturing program leads to a bachelor of science in engineering technology degree.

Degree candidates must earn 184 credits by completing the following seven-year curriculum.

First-Year Courses	<i>Fall</i>	GET	4105	Introduction to Computers
		MTH	4107	College Algebra
	<i>Winter</i>	GET	4170	Engineering Graphics 1
		MTH	4108	Pre-Calculus
	<i>Spring</i>	GET	4171	Engineering Graphics 2
		GET	4102	Introduction to Engineering Technology
Second-Year Courses	<i>Fall</i>	MTH	4120	Calculus 1
		ENG	4100	Critical Writing 1
	<i>Winter</i>	MTH	4121	Calculus 2
		PHY	4117	Physics 1
		PHY	4196	Physics Lab 1
	<i>Spring</i>	MTH	4196	Math for Engineering Technology
		PHY	4118	Physics 2
		PHY	4197	Physics Lab 2
Third-Year Courses	<i>Fall</i>	EET	4320	Electricity and Electronics
		PHY	4198	Physics Lab 3
		MET	4301	Mechanics A
	<i>Winter</i>	MET	4380	Materials A
		MET	4302	Mechanics B
	<i>Spring</i>	GET	4104	Introduction to Product Design
		MFG	4321	Computer-Aided Manufacturing 1
Fourth-Year Courses	<i>Fall</i>	MET	4388	Measurements and Analysis
		ENG	4111	Critical Writing 2
		MFG	4322	Computer-Aided Manufacturing 2
	<i>Winter</i>	ECN	4115	Economic Principles and Problems 1
		GET	4200	Visual Basic Programming
	<i>Spring</i>	MFG	4331	Computer Methods in Manufacturing 1
		GET	4306	Technical Communications
		(	)	Social Science/Humanities Elective

Fifth-Year Courses

<i>Fall</i>	CHM	4130	Chemical Principles 1
	MET	4340	Thermodynamics A
	()		Social Science/Humanities Elective
<i>Winter</i>	GET	4356	Engineering Economy
	MET	4373	Fluid Mechanics
	MET	4392	Fluid Mechanics Laboratory
<i>Spring</i>	MET	4314	Stress Analysis A
	()		Manufacturing Technical Elective
	()		Basic Science Elective*

Sixth-Year Courses

<i>Fall</i>	MET	4315	Stress Analysis B
	MET	4391	Mechanics Laboratory
	()		Communications Elective
<i>Winter</i>	MET	4330	Mechanical Design A
	MET	4393	Thermal Analysis Laboratory
	()		Social Science/Humanities Elective
<i>Spring</i>	MET	4331	Mechanical Design B
	MET	4395	Design Laboratory
	()		Social Science/Humanities Elective

Seventh-Year Courses

<i>Fall</i>	()		Manufacturing Technical Elective
	()		Social Science/Humanities Elective
<i>Winter</i>	()		Manufacturing Technical Elective
	()		Communications Elective
<i>Spring</i>	()		Manufacturing Technical Elective
	()		Social Science/Humanities Elective

Suggested Technical Electives

MET	4414	Mechanical Vibrations
MET	4416	Stress Analysis C
MET	4444	Power Generation
MET	4482	Applied Metallurgy
MET	4342	Refrigeration and Air Conditioning
MET	4152	Circuit Analysis 2
EET	4324	Circuit Analysis Lab 1
EET	4325	Circuit Analysis Lab 2
EET	4311	Digital Electronics 1
EET	4312	Analog Electronics 1
GET	4100	Computer Programming
GET	4364	Kinematics
MET	4481	Materials

Also, all other MET/MFG courses offered in the evening (part-time) mechanical or manufacturing curriculum.

*Basic Science Elective may be chosen from one of the following:

BIO	4103	Biology
CHM	4105	Chemistry and the Environment
CHM	4131	Chemical Principles 2
PHY	4119	Physics 3
ESC	4204	Physical Geology
ESC	4221	Environmental Geophysics

Aerospace Maintenance Engineering Technology (Major Code 098)

The Aerospace Maintenance Engineering Technology program leads to the bachelor of science in engineering technology degree. Before entering the program, degree candidates must complete the East Coast Aero Technical School airframe and power plant technical curriculum or its equivalent. In addition, degree

candidates must complete four prerequisite courses. The prerequisite courses are MTH 4107 College Algebra, MTH 4108 Pre-Calculus, MTH 4120 Calculus 1, and CHM 4130 Chemical Principles 1. Degree candidates must earn at least 189 credits by completing the following five-year curriculum.

First-Year Courses	<i>Fall</i>	GET	4170	Engineering Graphics 1
		MTH	4121	Calculus 2
	<i>Winter</i>	GET	4171	Engineering Graphics 2
		MTH	4122	Calculus 3
	<i>Spring</i>	GET	4100	Computer Programming for Engineering Technology
		(	)	Social Science/Humanities Elective
Second-Year Courses	<i>Fall</i>	ENG	4100	Critical Writing 1
		PHY	4117	Physics 1
		PHY	4196	Physics Lab 1
	<i>Winter</i>	ENG	4111	Critical Writing 2
		PHY	4118	Physics 2
		PHY	4197	Physics Lab 2
	<i>Spring</i>	GET	4306	Technical Communications
		PHY	4119	Physics 3
		PHY	4198	Physics Lab 3
Third-Year Courses	<i>Fall</i>	ECN	4115	Economic Principles and Problems 1
		MET	4301	Mechanics A
	<i>Winter</i>	MET	4302	Mechanics B
		MET	4340	Thermodynamics A
	<i>Spring</i>	MET	4314	Stress Analysis A
		MET	4380	Materials A

Fourth-Year Courses

<i>Fall</i>	MET	4388	Measurement and Analysis 1
	()		Social Science/Humanities Elective
	()		Social Science/Humanities Elective
<i>Winter</i>	EET	4320	Electricity and Electronics
	MET	4341	Thermodynamics B
	MET	4389	Measurement and Analysis 2
<i>Spring</i>	MET	4373	Fluid Mechanics
	()		Social Science/Humanities Elective

Fifth-Year Courses

<i>Fall</i>	MET	()	Technical Elective
	()		Social Science/Humanities Elective
<i>Winter</i>	MET	()	Technical Elective
	()		Open Elective*
	()		Social Science/Humanities Elective
<i>Spring</i>	MET	4481	Materials B
	()		Social Science/Humanities Elective
	()		Social Science/Humanities Elective

Suggested Technical Electives

Same as Mechanical Engineering Technology suggested technical electives (see page 21).

*Open Elective may be a three or four quarter-hour course.

Telecommunications Program

Telecommunications is an interdisciplinary concentration demanding skills and information from several areas of engineering technology. Modern society has experienced an unprecedented growth in information processing and communications, so that individuals who can help design and maintain information and communication systems are in high demand.

We offer an associate's degree program in telecommunications, which provides you the

opportunity to study the electronic transfer of information through voice, data, or video media. Specific methods of electronic transfer, such as electronic signals in wires, light waves in optic fibers, and radio waves in the earth's atmosphere, are discussed. There are career opportunities in the telephone, data processing, radio transmission/reception, cable television, service, and computer industries.

Telecommunications (Major Code 038)

The Telecommunications program leads to the associate in science degree. Degree candidates

must earn 102 credits by completing the following four-year curriculum.

First-Year Courses

<i>Fall</i>	GET	4105	Computer Applications for Technology
	MTH	4107	College Algebra
<i>Winter</i>	GET	4170	Engineering Graphics 1
	MTH	4108	Pre-Calculus
<i>Spring</i>	GET	4100	Computer Programming
	GET	4102	Introduction to Engineering Technology

Second-Year Courses

<i>Fall</i>	ENG	4100	Critical Writing 1
	MTH	4120	Calculus 1
<i>Winter</i>	MTH	4121	Calculus 2
	PHY	4117	Physics 1
	PHY	4196	Physics Lab 1
<i>Spring</i>	EET	4180	Introduction to Telecommunications
	PHY	4118	Physics 2
	PHY	4197	Physics Lab 2

Third-Year Courses

<i>Fall</i>	EET	4151	Circuit Analysis 1
	ENG	4111	Critical Writing 2
	PHY	4119	Physics 3
	PHY	4198	Physics Lab 3
<i>Winter</i>	EET	4384	Video Communications
	EET	4124	Circuits Lab 1
	EET	4152	Circuit Analysis 2
<i>Spring</i>	EET	4125	Circuits Lab 2
	GET	4306	Technical Communications

Fourth-Year Courses

<i>Fall</i>	EET	4311	Digital Electronics 1
	EET	4381	Telecommunications Systems 1
<i>Winter</i>	EET	4312	Analog Electronics 1
	EET	4382	Telecommunications Systems 2
<i>Spring</i>	EET	4310	Electrical Measurements
	EET	4383	Telecommunications Systems 3

Certificate Program Descriptions

C++/UNIX Specialist Certificate Program

(Major Code 070)

This certificate program enables individuals to improve or increase their knowledge of the latest computer software developments. People wishing to improve their chances of changing or obtaining a job dealing with state-of-the-art topics in the computer field should enroll in this program.

You may be eligible to enter the certificate program if you hold a BS, a BA, or have work experience in the computer industry and knowl-

edge of a higher-level language. In addition, a combined maximum of two courses may be waived via transfer credit or proficiency examination. If you have none of the listed requirements but are interested in learning how to become qualified to enter the program, contact The Lowell Institute School at 617-373-2500.

A sample program showing how the certificate can be earned in one year of part-time study, taking three courses per quarter, follows.

<i>Fall</i>	CT	4150	Computer Organization
	CT	4311	Programming with the C++ Language
	GET	4306	Technical Communications
<i>Winter</i>	CT	4330	Data Structures
	CT	4393	UNIX Operating System
	TCC	4301	Computer Software Technical Writing 1
<i>Spring</i>	CT	4340	Software Engineering Design
	CT	4394	C++ Object-Oriented Programming
	TCC	4302	Computer Software Technical Writing 2

Computer Technology Certificate Program

(Major Code 072)

This certificate program introduces students to both the hardware and software aspects of the computer field. An extensive menu of elective courses allows students to direct their individual programs to emphasize either hardware or software skills.

Upon completion of the program, a student will have the required skills to successfully enter the computer employment market.

Students planning to continue their education beyond the certificate level will be able to transfer all certificate coursework toward

the associate's or bachelor's degree programs. Prerequisites for the Computer Technology Certificate program include knowledge of algebra and elementary circuit analysis.

If you have none of the listed requirements but are interested in learning how to become qualified to enter the program, contact The Lowell Institute School at 617-373-2500.

A sample program showing how the certificate can be earned in two years of part-time study, taking two courses per quarter, follows.

First-Year Courses

<i>Fall</i>	CT	4150	Computer Organization
	GET	4105	Computer Applications for Technology
<i>Winter</i>	EET	4311	Digital Electronics 1
	GET	4100	Computer Programming
<i>Spring</i>	CT	4311	Programming with the C++ Language
	EET	4314	Digital Electronics 2

Second-Year Courses

<i>Fall</i>	CT	4330	Data Structures
	CT	4345	Assembly Language
<i>Winter</i>	CT	4374	Introduction to CPU Hardware
	(	)	Technical Elective
<i>Spring</i>	(	)	Technical Elective
	(	)	Technical Elective

Suggested Technical Electives (Select Three)

Credit Courses

GET	4200	Visual Basic Programming
CT	4340	Software Engineering Design
CT	4351	Advanced Computer Organization
CT	4355	Micro Peripheral Hardware
CT	4356	Complex Peripheral Hardware
CT	4375	CPU Architecture
CT	4380	Data Communication Methods
CT	4381	Operating Systems
CT	4383	Databases
CT	4387	Bit Slice Microcomputers
CT	4389	Single Chip Microprocessor
CT	4393	UNIX Operating System
CT	4394	Object-Oriented Programming
CT	4397	Advanced UNIX Programming
CT	4470	Introduction to X Windows
CT	4480	Local Area Network 1
CT	4481	Local Area Network 2
CT	4494	Distributed Operating Systems

Noncredit Course

GET	4112	DOS 6.2
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Electronics Technology Certificate Program

(Major Code 073)

This certificate program introduces students to both the analog and digital branches of electronics. The elective course offerings provide students with the opportunity to direct their individual programs toward the communications, telecommunications, or computer areas.

Upon completion of the program, a student will be well prepared for employment in the electronics field.

Students planning to continue their education beyond the certificate level will be able to transfer all certificate coursework toward the

associate's or bachelor's degree programs.

Prerequisites for the Electronics Technology Certificate program include knowledge of algebra and trigonometry and elementary electric circuits or physics.

If you have none of the listed requirements but are interested in learning how to become qualified to enter the program, contact The Lowell Institute School at 617-373-2500.

A sample program showing how the certificate can be earned in two years of part-time study, taking two courses per quarter, follows.

First-Year Courses

<i>Fall</i>	EET	4151	Circuit Analysis 1
	MTH	4120	Calculus 1
<i>Winter</i>	EET	4152	Circuit Analysis 2
	MTH	4121	Calculus 2
<i>Spring</i>	EET	4124	Circuits Lab 1
	EET	4312	Analog Electronics 1

Second-Year Courses

<i>Fall</i>	EET	4125	Circuits Lab 2
	EET	4313	Analog Electronics 2
<i>Winter</i>	EET	4311	Digital Electronics 1
	(	)	Technical Elective
<i>Spring</i>	(	)	Technical Elective
	(	)	Technical Elective

Technical Elective Courses (Select Three)

Credit Courses

EET	4314	Digital Electronics 2
EET	4370	Digital Computers 1
EET	4317	Principles of Communication Systems 1
EET	4318	Principles of Communication Systems 2
EET	4381	Telecommunications Systems 1
EET	4382	Telecommunications Systems 2
GET	4100	Computer Programming
CT	4311	Programming with the C++ Language
CT	4150	Computer Organization

Noncredit Courses

GET	4110	Field Programmable Gate Array Design
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Engineering Graphics Technology Certificate Program

(Major Code 071)

This certificate program introduces students to the fundamentals of engineering graphics design; computer-aided design using AUTOCAD; dimensioning, tolerancing, and solids modeling. This certificate program includes a detailed introduction to the use of computers.

Upon completion of the program, a student will have the required skills to successfully enter the graphics technology market.

Students planning to continue their education beyond the certificate level will be able to transfer all certificate coursework toward the

associate's or bachelor's degree programs in mechanical engineering technology.

Prerequisites for the Graphics Technology Certificate program include knowledge of algebra and trigonometry. If you have none of the listed requirements but are interested in learning how to become qualified to enter the program, contact The Lowell Institute School at 617-373-2500.

A sample program showing how the certificate can be earned in four quarters of part-time study, taking two courses per quarter, follows.

First-Year Courses

<i>Fall</i>	GET	4175*	Introduction to Design Graphics
	GET	4105	Computer Applications for Technology
<i>Winter</i>	GET	4170	Engineering Graphics 1
	GET	4176*	Geometric Dimensioning and Tolerancing
<i>Spring</i>	GET	4171	Engineering Graphics 2
	()		Technical Elective

Second-Year Courses

<i>Fall</i>	()	Technical Elective
	()	Technical Elective

Suggested Technical Electives

GET	4364	Kinematics
GET	4173	AutoCad for Architects and Engineers
GET	4174	AutoCad Solids Modeling
MFG	4321	Computer-Aided Manufacturing 1
MFG	4322	Computer-Aided Manufacturing 2
CT	4150	Computer Organization
GET	4104	Introduction to Product Design
GET	4200	Visual Basic Programming

*Denotes the course is not transferable for credit toward an associate's or bachelor's degree program.

Minor Program Descriptions

Overview

This section lists required courses for minor degrees in computer technology, electrical engineering technology, and mechanical engineering technology. You do not have to be enrolled in a program to obtain one of these minors but must meet the course prerequisites published in the course descriptions section of this *Bulletin*. Before you pursue a minor, consult one of our

academic advisers concerning eligibility and scheduling. Advisers are available in The Lowell Institute School Dean's Office, 120 Snell Engineering Center, or by phone at 617-373-2500. Minors will be indicated on your transcript after you have satisfactorily completed the minor requirements and have received your degree.

Computer Technology Minor Program

To qualify for the minor in computer technology, you must complete the following courses and laboratory.

CT	4311	Programming with the C++ Language
CT	4330	Data Structures
CT	4340	Software Engineering Design
CT	4345	Assembly Language
CT	4374	Introduction to CPU Hardware
CT	4375	CPU Architecture <i>or</i> CT 4393 UNIX Operating System
CT	4381	Operating Systems

Electrical Engineering Technology Minor Program

To qualify for the minor in electrical engineering technology, you must complete the following courses and laboratories.

EET	4151	Circuit Analysis 1
EET	4152	Circuit Analysis 2
EET	4124	Circuits Laboratory 1
EET	4125	Circuits Laboratory 2
EET	4311	Digital Electronics 1
EET	4312	Analog Electronics 1
EET	4323	Electronics Laboratory
EET	4330	Energy Conversion <i>or</i> EET 4377 Control Engineering 1

Mechanical Engineering Technology Minor Program

To qualify for a minor in mechanical engineering technology, you must complete the following courses.

MET	4301	Mechanics A
MET	4302	Mechanics B
MET	4314	Stress Analysis A
MET	4340	Thermodynamics A
MET	4373	Fluid Mechanics
MET	4380	Materials A
MET	4388	Measurement and Analysis 1
MET	4389	Measurement and Analysis 2

Course Descriptions

Overview

This section contains the following information about each course offered by The Lowell Institute School.

- **Course number.** Each alpha/numeric course number provides specific information. For example, consider the course number CET 4301.

CET 4301 The alpha code indicates which department is offering the course. In this case, the department is civil engineering technology.

CET 4301 The first number in the numeric code indicates whether the course is offered through the full- or part-time division. All 4000 series courses are offered part time and most 1000 series courses are offered full time.

CET 4301 The last three numbers in the code indicate the course level: 001–099 are compensatory courses; 100–299 are introductory- to intermediate-level courses; and 300–699 are advanced-level courses.

- **Course title.**
- **Number of quarter hours (QH).** One quarter hour represents approximately three hours of student learning time (fifty minutes of lecture plus two hours of independent study) per week. If appropriate, class hours (CH) and lab hours (lab) are listed as well.
- **Quarters in which the course is offered.** Not all courses are offered every quarter. If the code TBA is printed next to a course title, call the program coordinator at 617-373-2500 for scheduling information.
- **Topics discussed in the course.**
- **Prerequisites.** Complete prerequisites before enrolling, unless otherwise specified.

Use the curriculum listed for your program to determine which courses you need to complete

in the next academic year (“Program Descriptions,” see page 5). Use the course descriptions to read about each specific course and to learn the quarters in which the course is offered. Because most courses are not offered every quarter, plan your course load for the entire academic year, not just the next quarter.

Before registration, get the *University College and The Lowell Institute School Schedule* for the next quarter by calling 617-373-2500. The *Schedule* provides you with the meeting times and locations for the courses being offered during the next quarter.

Academic counseling is available to help you plan your course load for the coming academic year. In addition, you can get a current *Tentative Part-Time Schedule*, which is published annually. If you need help, contact a Lowell Institute School program counselor at 617-373-2500.

Policy on Changes of Program

The Lowell Institute School reserves the right to cancel, modify, or add to the courses in any curriculum. The University further reserves the right to change the requirements for graduation. Any changes that may be made from time to time relative to this policy shall be applicable to all students in the school, college, or department concerned, including former students who may re-enroll.

Guidelines for Choosing Electives

Many of the degree program curricula require students to complete electives. The electives give students the opportunity either to explore topics beyond the curriculum’s scope or to gain extensive knowledge about topics introduced by the core courses.

Open Electives

Any course is acceptable as an open elective except physical education, military science, and preparatory courses. An open elective may be either a three or a four quarter-hour course, depending on your major.

Social Science/Humanities Electives

Social science/humanities electives are offered through University College and must be chosen from a list that is available from The Lowell Institute School. Some majors require that six quarter-hours of social science/humanities electives be in the communication studies (CMN) category.

Technical Electives

Technical electives must be chosen from the list of suggested technical electives appearing at the end of the respective degree curriculum. Students wishing to take an upper-level course that does not appear on the list must petition for permission before attending the class. Students should submit a proposed program of elective courses—preferably representing a minor field of concentration consistent with personal career objectives—for approval by the program coordinator.

Preprofessional Medical Courses

The following information is provided for students who plan to apply for admission to schools of medicine, osteopathy, dentistry, podiatry, or optometry. Those who wish to pursue veterinary medicine may need to meet different entrance requirements and should consult the chair of the Health Professions Advisory Committee for additional advice at 617-373-2818.

Medical School Admission Requirements

Students must complete the following courses before they may enroll in medical school, and should complete them before taking the school's particular admission test (MCAT, DAT, and so on). MCAT exam applications are available from the Office of Career Development, 120 Ryder Hall, 617-373-2430.

- Biology: one year (with labs)
- General chemistry: one year (with labs)
- Organic chemistry: one year (with labs)
- Physics: one year (with labs)
- College mathematics: one year (with some calculus)
- College English: one year

Northeastern University's Health Professions Advisory Committee provides academic advice and help with professional school applications to students in any of the University's health

programs. Although advice is available to anyone enrolled in a course, the committee can prepare evaluation letters only for those who have letters of recommendation from at least two North-eastern faculty members.

Sources of Advice**General Counseling, Application Procedures, and Entrance Exams**

C. H. Ellis, Jr., Chair
Health Professions Advisory Committee
Department of Biology
College of Arts and Sciences
445 Richards Hall
Northeastern University
Boston, Massachusetts 02115
617-373-4032

Course Schedules and Counseling

Health Professions and Sciences Programs
University College
266 Ryder Hall
Northeastern University
Boston, Massachusetts 02115
617-373-2818

Physics and Mathematics Courses

The Lowell Institute School
120 Snell Engineering Center
Northeastern University
Boston, Massachusetts 02115
617-373-2500

Course Sequences to Meet Minimum Admission Requirements

Acceptable course sequences may be taken at University College to prepare students for health profession schools. Completing one sequence from each category should meet the minimum requirements of most medical or dental schools. If you have questions about whether other courses might be applicable, contact Dr. Shirley Russo or Professor Ellis. You should contact medical or dental school(s) directly to obtain guidance on specific courses required for admission.

General Biology: BIO 4103, BIO 4104, BIO 4105. Lab required. Other biology courses—such as anatomy, physiology, and microbiology—may be acceptable, depending on the professional school. General biology is highly recommended even if you have already taken the other courses.

Chemical Principles: CHM 4130, CHM 4131, CHM 4132. Lab required.

Organic Chemistry: CHM 4261, CHM 4262, CHM 4263. Lab required.

General Physics: PHY 4117, PHY 4118, PHY 4119, and labs PHY 4196, PHY 4197, PHY 4198.*

Mathematics: MTH 4108, MTH 4120, MTH 4121.

English: ENG 4100, ENG 4111, ENG 4112.

Requirements in two additional areas, if needed—behavioral science and biochemistry—can be met by the following courses.

Behavioral Science: PSY 4110, PSY 4111, PSY 4112, and/or other psychology courses.

Biochemistry: CHM 4371, CHM 4372, CHM 4373 or BIO 4246, BIO 4247, BIO 4248.

Chemistry

CHM 4111 General Chemistry 1

This course has been replaced by CHM 4130 Chemical Principles 1.

CHM 4130 Chemical Principles 1[†]

(4 QH) Fall, Summer

(Formerly CHM 4111 3 QH.) Introduces fundamental chemistry concepts, including symbols, formulas, equations, atomic weights, and calculations based on equations. Covers gases, liquids, solutions, and ionization. Required lab is CHM 4137 Lab for Chemical Principles 1. Lab fee. (Not open to students who have taken CHM 4111.) *Prereq.* MTH 4107 or concurrently or equiv.

Civil Engineering Technology

CET 4301 Plane Surveying

(4 QH) TBA

Examines surveying principles; theory of measurements; leveling; traverse computations; area calculation; and stadia principles and topography. *Prereq.* MTH 4108.

CET 4302 Geodetic Surveying

(4 QH) TBA

Introduces practical astronomy for surveying, including basic spherical trigonometry. Covers geodetic surveying, including precise leveling, triangulation, EDM equipment, and baseline measurements. *Prereq.* CET 4301.

CET 4303 Route Surveying

(4 QH) TBA

Studies simple and compound curves, vertical curves, earthwork computations, solution of the mass diagram, and an introduction to route location by photogrammetry. *Prereq.* CET 4301.

CET 4307 Legal Aspects of Surveying

(4 QH) TBA

Covers registry of deeds and probate, ownership of land, deeds, descriptions of qualifying expression, adverse possession, Massachusetts land court, and expert witness. *Prereq.* CET 4301.

CET 4311 Highway Engineering

(4 QH) TBA

Explores engineering considerations in the planning and construction of modern highways and highway routing, traffic flow and traffic control, and computer applications to transportation problems. *Prereq.* CET 4301.

CET 4316 Land Use Planning

(4 QH) TBA

Studies environmental, sociological, economic aspects, and traditional basis for land use planning. Covers objectives, content, form, and preparation of plan; community and public facilities; transportation; and environmental impact and plan implementation. *Prereq.* GET 4171.

CET 4321 Introduction to Structural Design

(2 CH, 4 lab, 4 QH) TBA

Presents tabular methods for the design of members and connections using the AISC Code. *Prereq.* GET 4171 and MET 4314.

CET 4324 Structural Analysis 1

(4 QH) TBA

Surveys the reactions, shears, bending moments, and forces developed by loading systems on beams and trusses; influence lines for beams, girders, and trusses; and solutions for forces from moving load systems on statically determinate structures. *Prereq.* MET 4315.

CET 4325 Structural Analysis 2

(4 QH) TBA

Covers classical methods of deflection solution for beams and trusses. Discusses methods of solving statically indeterminate structures. *Prereq.* CET 4324.

*Some medical schools have allowed PHY 4101 and PHY 4102 College Physics 1 and 2 to be used for admission. Before choosing this sequence, contact the school you wish to apply to for their preference for a physics course sequence.

[†]This is a University College course offered at a different tuition rate.

CET 4331 Steel Design 1
(4 QH) TBA

Examines design of steel members in structural frames; tension, compression, bending and eccentrically loaded members; and design of plate girders for buildings. *Prereq.* CET 4321 and MET 4315.

CET 4332 Steel Design 2
(4 QH) TBA

Presents design of steel for highway bridges, composite design in bridges and buildings, introduction to plastic analysis, and design in steel. *Prereq.* CET 4331.

CET 4350 Environmental 1
(4 QH) TBA

Examines principles of water supply engineering, population forecasting, and quality and quantity of water for various uses. Other topics include water treatment processes, collection and disposal of wastewater and storm water, modern treatment methods, and wastewater plant operation. *Prereq.* MET 4370 and CHM 4130 or CHM 4111.

CET 4351 Environmental 2
(4 QH) TBA

Studies the layout and design of water treatment and sewage treatment plants, and instrumentation and electrical equipment. Includes laboratory demonstrations. *Prereq.* CET 4350.

CET 4361 Materials and Soil Mechanics
(4 QH) TBA

Examines the physical properties of portland cement, aggregates, mixing water and admixtures; batch proportioning; bituminous materials; index properties of soils, soil moisture, and structure; compressibility; and theory of consolidation. *Prereq.* MET 4315.

CET 4371 Concrete Design 1
(4 QH) TBA

Examines the design of bending members and of axially and eccentrically loaded columns by elastic and ultimate strength principles. *Prereq.* MET 4315.

CET 4372 Concrete Design 2
(4 QH) TBA

Covers the reinforced concrete design of basic structures, including considerations of continuity. Includes an introduction to prestressed concrete member design. *Prereq.* CET 4371.

CET 4393 Construction Administration
(4 QH) TBA

Discusses contracts, specifications, and bidding procedures; estimating and scheduling, including critical path; and personnel administration and union negotiation. Includes bid preparation for a small project. *Prereq.* None.

CET 4399 Special Problems in Civil Engineering Technology **(4 QH) TBA**

Engages students in theoretical or experimental work under individual faculty supervision. *Prereq.* Permission of department chair.

Computer Technology

CT 4150 Computer Organization
(4 QH) Fall

Presents a study of the basic elements of a computer system, such as synchronous and asynchronous counters, registers, magnitude comparator, digital-to-analog and analog-to-digital converters, and memory devices. *Prereq.* None.

CT 4311 Programming with the C++ Language
(4 QH) All Quarters

Students will write programs in C++, a language suitable for programming operating systems and text processing. Covers functions, arrays, pointers, character strings, polymorphism, classes, operator overloading, inheritance, and templates. Introduces the OOP programming concepts. *Prereq.* GET 4100.

CT 4330 Data Structures
(4 QH) Fall, Winter

Introduces methods of representing and manipulating data in computer memory. Covers stacks, queues, lists, trees, heaps, sets, graphs, hashing, searching, and sorting. Project required. *Prereq.* CT 4311.

CT 4335 Numerical Methods
(4 QH) Fall

Presents computer methods for solving mathematical problems. Involves writing and running application programs using the University's computer facilities. Covers deterministic versus stochastic methods, random number generators, iterative versus noniterative solutions, maxima and minima in two and three variables, curve fitting in two and three variables, integrals, trapezoidal and Simpson's rules, slopes, differential equations in two and three variables, vector and matrix algebra, simultaneous linear equations, nonlinear equations, permutations, and combinations. *Prereq.* CT 4311 and MTH 4122.

CT 4340 Software Engineering Design
(4 QH) Spring

Offers structured methods for developing complex computer software. Explores developing structured specifications, structured designs, and the computer programs for complex problems using the University's computers. Topics include partitioning, hierarchical organization, data flow diagrams, data dictionaries, structured English, decision trees, decision tables, structured charts, team design, structured programs, and maintainability. *Prereq.* CT 4330.

CT 4345 Assembly Language
(4 QH) Fall, Winter

Teaches typical microprocessor assembly language. Involves writing and running programs on a 68000 microprocessor-based system. Covers CPU architecture, instruction sets, addressing modes, binary operation, code conversion, subroutines, macros, and input/output. *Prereq.* CT 4150 and CT 4311.

**CT 4346 Assembly Language Lab
(1 QH) Winter**

Teaches how to program in 68000 assembly language and presents arithmetic operations, logic operations, use of input/output functions available in the 68000 as part of a line editor experiment, control of a single-digit hexadecimal display output, use of hardware and software timers to generate a digital clock display, and other experiments that are consistent with the ones described above. *Prereq. CT 4311 and CT 4150.*

**CT 4348 LISP
(4 QH) TBA**

Introduces an interactive language in which the LISP interpreter is commonly referred to as the read-evaluate-print loop. Discusses various levels of implementation in LISP, a language well-suited to implement the standard techniques of data structure manipulation. Also explores techniques for recursion, complex data structures, storage management, and symbol table manipulation. *Prereq. CT 4330.*

**CT 4351 Advanced Computer Organization
(4 QH) Winter**

Examines the functional characteristics of complex and special purpose computer systems, and the functions of general purpose multi-user and multi-processing operating systems. Advanced topics include virtual memory and virtual machine architectures, distributed and multiprocessor systems, array processors, and system performance analysis. *Prereq. CT 4356 and CT 4375.*

**CT 4355 Micro Peripheral Hardware
(4 QH) Winter**

Covers the elements of microprocessor peripheral hardware and its interfacing. Involves designing and analyzing microprocessor systems, including detailed schematics, timing diagrams, and technical documentation. Topics include serial input/output devices, DMA and interrupt control devices, standard busses, bus arbitration techniques, and bus support VLSI. *Prereq. CT 4374.*

**CT 4356 Complex Peripheral Hardware
(4 QH) Fall**

Studies the interfacing and implementation of complex peripheral systems. Topics include disk and tape interfaces, graphic display devices, communication interfaces and subsystems, and input/output processors. *Prereq. CT 4355.*

**CT 4360 Industry Software
(4 QH) Fall, Spring**

Surveys current commercial software packages and methods. Involves the exercise of commercial packages implemented on the University's computer facilities where applicable. Topics include specific current packages and methods drawn from the categories of database management, scientific and statistical analysis, security and privacy, software assurance, and documentation. *Prereq. CT 4381.*

**CT 4365 Industry Hardware
(4 QH) Winter**

Discusses the latest industrial developments and trends in computer hardware. Conducted as a seminar. *Prereq. CT 4356.*

**CT 4369 Digital Electronics Design
(4 QH) Fall, Winter**

Introduces the hardware building blocks of digital computers. Teaches students to specify configurations of gates and memory components to achieve combinational and sequential composite logical functions and to perform finite state machine design and analysis. Topics include gates, flip-flops, registers, decoders, ALUs, memory arrays, and synchronous and asynchronous state machines. *Prereq. CT 4368.*

**CT 4370 Computer Lab 1
(2 QH) Fall**

Offers experiments to investigate and test the behavior of basic digital gates and to design and implement simple logic circuits using Boolean theorems. Topics include voltage, current resistance, logic gates, logic functions, gate outputs, fan-in, fan-out, square-wave generation, and operational amplifiers. *Prereq. EET 4311.*

**CT 4371 Computer Lab 2
(2 QH) Spring**

Provides experiments to design and implement building blocks of a computer system. Topics include counters, shift registers, arithmetic and logic units, control units, computer memory, A/D and D/A converters. *Prereq. CT 4369 and CT 4374.*

**CT 4372 Computer Lab 3
(2 QH) Winter**

Offers experiments that reinforce the concepts of microprocessor interfacing learned during classroom lectures. Topics include input/output ports, displays, interrupts, generating time intervals, interfacing mechanical switches, asynchronous communication, and memory systems. *Prereq. CT 4345 and CT 4374.*

**CT 4374 Introduction to CPU Hardware
(4 QH) Winter, Spring**

Presents basic computer architecture. Topics include number systems' operation and conversion, logic circuits, registers, data busses, ROM/RAM, micro-computer structure and operation, microprocessor internal components, microprocessor programming, and input/output processing. *Prereq. CT 4345 and CT 4369.*

**CT 4375 CPU Architecture
(4 QH) Fall**

Presents high-performance microprocessor architecture and hardware interfacing techniques. Analyzes current commercial processors and their support components. Topics include internal CPU architecture, memory management, instruction prefetch, privilege states, bus cycles, control lines, input/output, interrupts, exceptions, and pipelining. *Prereq. CT 4374.*

**CT 4377 VLSI Design
(4 QH) TBA**

Introduces Very Large Scale Integration (VLSI) Integrated Circuits (ICs), the key components of all modern computers. Examines MOS devices, circuits, design methods, and fabrication techniques used in producing custom VLSI ICs. Topics include MOS transistor characteristics; basic gate circuits; scaling; layout tools, both manual and automated; wafer fabrication techniques; standards; testing; and costs.

Prereq. CT 4369.

**CT 4380 Data Communication Methods
(4 QH) Spring**

Discusses the ISO Open Systems Interconnect model for communication systems, including the functional and operational aspects of data communication devices and software. Uses a black box approach. Topics include modems, control units, multiplexers, concentrators, front-end processors, and error checking.

Prereq. CT 4374.

**CT 4381 Operating Systems
(4 QH) Spring**

Introduces the basic principles and organization of operating system implementation. Topics include processor management, process multiplexing and synchronization, schedules, atomic operations and mutual exclusion, sequential and concurrent programming, memory, and device and data management.

Prereq. CT 4330 and CT 4345.

**CT 4383 Databases
(4 QH) TBA**

Examines database organization structure and management. Involves writing and running programs exemplifying techniques developed in class, using the University's computer facilities. Topics include access methods, attributes, indices, keys, querying, searching and matching, file sets, inverted file sets, normal forms, and random access. *Prereq.* CT 4330.

**CT 4387 Bit Slice Microcomputers
(4 QH) TBA**

The epitome of hardware flexibility is represented by the bit slice CPU. Students examine the basic design ground rules common to this style of hardware design. *Prereq.* CT 4355.

**CT 4389 Single-Chip Microprocessors
(4 QH) TBA**

When small 8-bit intelligent devices are rewired in high volume, the single-chip microprocessor in the form of the 3870, 8048, Z8, and others comes into play. An understanding of the hardware limitations of a single-chip system is the basis for this course. *Prereq.* CT 4375.

CT 4390 Special Problems in Computer Technology (4 QH) TBA

Students perform theoretical or experimental work under individual faculty supervision. *Prereq.* *Permission of department chair.*

**CT 4391 Topics in Computer Technology
(4 QH) TBA**

Focuses on advanced topics in Computer Technology to be selected by the instructor. *Prereq.* *Permission of the instructor.*

**CT 4393 UNIX Operating System
(4 QH) Winter**

Introduces UNIX operating system concepts, tools, and utilities. Helps students become proficient users. Develops a fundamental understanding and working knowledge of UNIX. Topics include system commands, file system concepts, text processing tools, electronic communication, processes, shell script programming, command procedures, pipes, I/O redirection, filters, system administration, and security. Students use the University's computer facilities to prepare course assignments. *Prereq.* CT 4311.

**CT 4394 Object-Oriented Programming
(4 QH) Spring**

Examines the methodologies currently used in object-oriented programming languages, drawing on case studies of Small Talk, Flavors, CLOS, and C++. Other topics include G-Base, an object-oriented database system, and the concepts of abstraction, polymorphism, class inheritance, locks, and generic dispatch. *Prereq.* CT 4330.

**CT 4395 Computer Security
(4 QH) TBA**

Covers issues related to security in computing, including the history of security, encryption techniques and applications, secure communications, and software protection. Other topics include software verification and validation, designing security into the hardware, and products currently available for securing systems and data. These subjects will be addressed in terms of privacy as well as reliability. *Prereq.* CT 4380 and CT 4381.

**CT 4397 Advanced UNIX Programming
(4 QH) TBA**

Studies the design and development of C application programs that interface with the UNIX operating system kernel. Enables C programmers to interact with the UNIX operating system through system calls and library routines. Topics include system programming tools, fundamental concepts, file creation and access, signals and signal handling, multitasking, file and terminal I/O, process creation and program execution, and forms of interprocess communication and synchronization (pipes, message queues, semaphores, and shared memory). Students use the University's computer facilities to prepare course assignments. *Prereq.* CT 4393.

**CT 4470 Introduction to X Windows
(4 QH) TBA**

Examines the basic theory of programming in X Windows. Topics include event-loops, 2D-drawing primitives, mouse-handlers, color, call backs, Xlib environment, Xt intrinsics, and widgets. Students use the University's computer laboratory facilities to run programs. *Prereq.* CT 4330 and CT 4393 or equiv.

CT 4475 Concurrent Engineering and Design Testability (4 QH) TBA

Studies techniques used by world-class manufacturers in designing electronic systems, boards, and devices. Examines how the systems are manufactured, tested, and maintained at minimum cost and delivered to market in the minimum time. Topics include concurrent engineering principles, digital and analog circuit design guidelines, commercially available micro-processors and support circuits, industry and government standards (IEEE 1149, MIL-STD 2165), and test techniques and strategies. *Prereq.* CT 4355.

CT 4480 Local Area Networks 1 (4 QH) Fall

Introduces Local Area Network concepts, architectures, application, protocols, and components. Focuses on the first three layers of the ISO reference model: physical, data link, and network layers. Examines Ethernet, SNA, Token Bus, Token Ring, and other IEEE standards. (Not open to students who have taken CT 4379.) *Prereq.* CT 4380.

CT 4481 Local Area Networks 2 (4 QH) Winter

Examines the upper four layers of the ISO reference model: transport, session, presentation, and application layers. Topics include TCP/IP, DECNET, NETBIOS, FTP, TELNET, and E-MAIL. *Prereq.* CT 4480 or permission of the instructor.

CT 4492 Independent Study in Computer Technology (4 QH) TBA

Independent study of advanced computer technology projects for students—usually in their junior or senior year—who have high scholastic standing. Projects may be of an applied or theoretical nature, resulting in a formal report submitted to the project supervisor at the end of the quarter. *Prereq.* Permission of adviser and project supervisor.

CT 4493 Independent Study in Computer Technology (4 QH) TBA

Independent study of advanced computer technology projects for students—usually in their junior or senior year—who have high scholastic standing. Projects may be of an applied or theoretical nature, resulting in a formal report submitted to the project supervisor at the end of the quarter. *Prereq.* Permission of adviser and project supervisor.

CT 4494 Distributed Operating Systems (4 QH) TBA

Covers in depth advanced design and analysis of OS concepts. Topics include security and access control, communication, synchronization, multiprocessor support, distributed shared memory, real-time distributed systems, fault-tolerant distributed systems, and ATM networks. Includes examples from real operating systems. Laboratory work includes programming and modification of operating systems components. *Prereq.* CT 4381.

Economics

ECN 4115 Economic Principles and Problems 1* (3 QH) All Quarters

Applies the basic principles of economics to current public problems. Focusing on macroeconomics, explores the issues of unemployment, inflation, national income and employment theory, and government expenditures and taxation. *Prereq.* None.

ECN 4116 Economic Principles and Problems 2* (3 QH) All Quarters

Continues ECN 4115, focusing on the role of the banking system, the Federal Reserve System, and supply-side policies. Topics in microeconomics include the role of a market pricing system, supply and demand, the costs of production, profits, and the supply decision. *Prereq.* ECN 4115 or equiv.

Electrical Engineering Technology

EET 4124 Circuits Laboratory 1 (3 lab, 2 QH) Winter, Spring

Involves experiments in DC electrical circuits and the study of various measurement techniques. Includes use of ammeters, ohmmeters, voltmeters, VOMs, and power supplies. Studies equivalent resistance, series and parallel circuits, Ohm's Law, Thevenin and Norton theorems, as well as superposition and maximum power transfer theorems. *Prereq.* EET 4151.

EET 4125 Circuits Laboratory 2 (3 lab, 2 QH) Fall, Spring

Offers further experimentation in electrical circuits and measurement techniques. Involves the operation of oscilloscopes, audio frequency and function generators. Explores inductance, capacitance, and the effect of frequency upon them. Studies measurements of amplitude, frequency, and phase shift using a variety of series/parallel RL, RC, and RLC circuitry. Examines circuit time constants and their relation to repetition rate, along with resonance, circuit quality, and filter circuits. *Prereq.* EET 4124.

*This is a University College course offered at a different tuition rate.

EET 4151 Circuit Analysis 1
(4 QH) Fall, Spring, Summer

Introduces circuit analysis concepts and laws through resistive circuits. Examines Ohm's Law and Kirchoff's current and voltage laws by solving a multitude of direct current circuits. Presents mesh and nodal analysis techniques that allow the student to solve more complex circuits than would be possible by just relying on equivalent resistance techniques. Also introduces Thevenin and Norton theorems as well as other techniques to reduce complex circuits to simpler equivalent circuits. Other topics include power relationships, operational amplifiers, and introduction to capacitors and inductors. Reviews computer-assisted solutions using Microcap and Mathcad. *Prereq. MTH 4120 and PHY 4119.*

EET 4152 Circuit Analysis 2
(4 QH) Fall, Winter, Summer

Introduces the solution to source-free RL and RC circuits employing first-order differential equations. Reviews superposition and the unit step response for first-order circuits and then the solution of second-order circuits using second-order differential equation. Presents steady-state sinusoidal circuit analysis using frequency domain techniques and phasor algebra. Reviews nodal and Mesh analysis and includes analysis in the frequency domain. Introduces average power, RMS voltage, and complex power and applies them to single-phase systems. Reviews Microcap and Mathcad to assist the student in the solution of complex circuits. *Prereq. EET 4151.*

EET 4180 Introduction to Telecommunications
(4 QH) Fall, Spring

Introduces students to voice, video, and data communications. Surveys the development of telephony and the operation of the telephone network. Emphasizes current developments in communications, particularly the use of digital transmission and switching. Introduces terminology peculiar to telephony. (Not open to electrical engineering technology majors.) *Prereq. None.*

EET 4310 Electrical Measurements
(4 QH) Spring

Examines standards of measurements, dimensional analysis, errors and measurements of dispersed data, discrete and continuous variables, binomial distribution, and normal distribution. Other areas include guaranteed error, methods of resistance measurements, digital voltmeters and analog-to-digital conversion, voltage references, potentiometers, and AC bridges. *Prereq. EET 4152.*

EET 4311 Digital Electronics 1
(4 QH) Fall, Summer

Introduces the basic elements of digital logic systems, starting with a complete discussion of numbering systems, including decimal, binary, octal, and hexadecimal. Continues with Boolean algebra, including applications of DeMorgan's theorems. Discusses the application of Boolean algebra to the solution of combinational logic circuit topologies. Examines the basic bistable memory storage element and applies this to the concept of sequential circuits such as counters and shift registers. Includes an analysis and design perspective of both combinational and sequential circuits. Some computer simulation may be required. *Prereq. EET 4152.*

EET 4312 Analog Electronics 1
(4 QH) Winter, Spring, Summer

Reviews the theory of linear circuits and extends it to simple nonlinear circuits of both two- and three-terminal varieties. Considers the terminal characteristics of the PN junction diode as an example of the two-terminal nonlinear device, and PNP, NPN, and field-effect devices as examples of three-terminal nonlinear elements. Considers the problem of selecting an operating point for a nonlinear device while proposing various practical biasing schemes. Introduces the small-signal linear Hybrid- π model for each three-terminal device. Explores the use of Mason flow graphs as an analysis tool. Introduces the concept of frequency response and mid-band gain. Some computer simulation may be required. *Prereq. EET 4152 and PHY 4119.*

EET 4313 Analog Electronics 2
(4 QH) Fall, Spring

Reviews small-signal models for three-terminal devices and discusses frequency response of such models, including the Bode asymptotic approximation to frequency response. Also reviews Mason's signal flow graph concepts for determining transfer functions. Examines operational amplifiers, including their ideal behavior and the limitations introduced by finite input and output impedances, finite gain, and finite bandwidth. Explores feedback and stability problems that can occur when using operational amplifiers. Studies applications of feedback to oscillators and active filters. *Prereq. EET 4312.*

EET 4314 Digital Electronics 2
(4 QH) Fall

Reviews the basics of Boolean algebra, combinatorial logic, and binary arithmetic. Extends these concepts to the design of coding systems such as binary, binary-coded decimal, Gray code, seven-segment displays, and multiplexers. Introduces flip-flops and sequential logic circuits such as ripple counters, synchronous counters, ring counters and Johnson counters, shift registers, solid-state memory devices, and the 555 timer. Emphasizes digital systems design using available microelectronic gates, primarily in the TTL series. *Prereq. EET 4313.*

**EET 4315 Digital Electronics 3
(4 QH) Winter**

Examines the physical devices used to realize digital circuits, as a complement to the previous treatment of idealized mathematical models. Introduces the concepts of rise-time, fall-time, set-up time, hold-time, delay-time, and the maximum frequency of a clock. Discusses the presently available logic families such as TTL, CMOS, and EC, and considers interconnection problems. Introduces memory elements and field-programmable logic elements. Presents interfacing devices such as analog-to-digital and digital-to-analog converters. *Prereq.* EET 4314.

**EET 4317 Principles of Communication Systems 1
(4 QH) Fall**

Introduces signal analysis using Fourier methods; noise in communication systems; frequency selective amplifiers, including wideband; transistor power amplifiers AF and RF; oscillators; signal sources; and applications. *Prereq.* EET 4313.

**EET 4318 Principles of Communication Systems 2
(4 QH) Winter**

Explores the basic theory of amplitude, frequency, phase, and pulse code modulated systems; analysis of modulating and demodulating circuits; carrier systems using SSB; system block and level diagrams; logic control circuits in communication systems; and modems. *Prereq.* EET 4317.

**EET 4319 Principles of Communication Systems 3
(4 QH) Spring**

Presents the fundamentals of digital communications; sampling requirements; analog-to-digital conversion methods; system capacity and bandwidth; comparison of practical digital systems PAM, PCM, PFM, and PWM; time and frequency division multiplexing; data decoding; and selected examples from telemetry and computer links. *Prereq.* EET 4318.

**EET 4320 Electricity and Electronics
(4 QH) Fall, Winter**

Introduces students to circuit analysis, resistive networks, periodic excitation functions, steady state AC circuits; study of the physical foundations of electronics and the physical operation of electronic devices. (Not open to electrical engineering technology majors.) *Prereq.* MTH 4120 and PHY 4119.

**EET 4323 Electronics Laboratory
(3 lab, 2 QH) Spring**

Offers experimentation with nonlinear semiconductors. Explores junction and zener diodes. Studies typical applications in clippers, clampers, rectification, filtering, electronic power supplies, voltage regulation, and integrated circuit regulators. Discusses bipolar and field effect transistors, amplifiers and voltage follower configurations, special semiconductors and operational amplifiers. *Prereq.* EET 4311.

**EET 4327 Advanced Electronics Laboratory 1
(3 lab, 2 QH) Fall**

Includes experiments using oscilloscopes and examines transistor audio amplifiers, push-pull amplifiers, drivers, pulse and video amplifiers, transients and wave-shaping circuits, audio frequency oscillators, and operational amplifiers. *Prereq.* EET 4323.

**EET 4328 Advanced Electronics Laboratory 2
(3 lab, 2 QH) Winter**

Experiments with the modulation of a class C amplifier, the diode detector, basic timing circuits, RF and crystal oscillators, astable multivibrators, logic gates, flip-flops, binary adders, registers, and counters. Considers active filters, frequency modulation detectors, and analog-to-digital and digital-to-analog conversion. *Prereq.* EET 4327.

**EET 4329 Advanced Electronics Laboratory 3
(3 lab, 2 QH) Spring**

Involves spectral studies of FM and PM waves; amplitude limiters; the balanced modulators and single sideband generators; integrated circuit timers and monolithic random access memory; and monolithic phase-locked loop. Offers microwave experiments and a series of digital experiments. *Prereq.* EET 4328.

**EET 4330 Energy Conversion
(4 QH) Spring**

Reviews magnetic circuits and fields associated with rotating devices and transformers. Examines energy storage in magnetic circuits and modeling and analysis of transformers. Introduces steady-state modeling and performance of DC, synchronous, and induction motors and generators. *Prereq.* EET 4353.

**EET 4337 Distributed Systems
(4 QH) Spring**

Examines radiation, transmission, and reception of electromagnetic waves; distributed-line constants and traveling waves of transmission lines; and differential equations of the uniform line. *Prereq.* MTH 4122 and PHY 4119.

**EET 4353 Circuit Analysis 3
(4 QH) Fall, Spring**

Completes the sinusoidal circuit analysis begun in Circuit Analysis 2 by reviewing techniques applicable to three-phase circuits, including both DELTA and WYE configurations. Reviews transient circuit analysis and introduces mutual inductance and the ideal transformer model. Introduces Laplace transforms and applies them to impedances and initial circuit conditions. Uses Laplace techniques to transfer circuits into the frequency domain for circuit analysis purposes. Introduces transfer functions along with poles and zeros to define stability and reviews the algebra of transfer functions. Reviews Microcap and Mathcad to assist the student in solution of complex circuits. *Prereq.* EET 4152.

EET 4354 Circuit Analysis 4**(4 QH) Winter, Summer**

Reviews sinusoidal circuit analysis using phasors and relates this solution technique to that of Laplace transforms. Analyzes transfer functions by creating and examining amplitude and phase response equations as a function of frequency. Introduces Bode plots of amplitude and phase response. Introduces Fourier series and its use as an analysis tool. Each student presents a 15–20 minute presentation on some aspect of filter design as it relates to a specific circuit of the student's choice. Reviews Microcap and Mathcad to assist the student in solution of complex circuits.

Prereq. EET 4353.

EET 4362 Basic Power Systems 1**(4 QH) Fall**

Presents fundamentals of single-phase and three-phase power systems. Introduces symmetrical components and sequence networks, two- and three-winding power transformers modeling, and the per unit system. Explores calculation of power transmission line parameters: resistance, inductance, and capacitance.

Prereq. EET 4354.

EET 4363 Basic Power Systems 2**(4 QH) Winter**

Examines modeling and steady-state operation of transmission lines. Develops power flow analysis techniques. Introduces symmetrical faults and fault interruption via circuit breakers and fuses.

Prereq. EET 4362.

EET 4364 Basic Power Systems 3**(4 QH) Spring**

Introduces unsymmetrical faults, power system relaying and protection, turbine-generator control, economic dispatch of generation, power system stability, and transient analysis of traveling waves.

Prereq. EET 4363.

EET 4370 Digital Computers 1**(4 QH) Fall**

Introduces the field of digital computer design. Topics include general computer organization, number systems and number representations, design characteristics of major computer units, and Boolean algebra applications to computer design.

Prereq. EET 4314.

EET 4371 Digital Computers 2**(4 QH) Winter**

Examines microprocessor architecture and organization. Studies the machine language and assembly coding of an industry-accepted microprocessor. Assigns an assembly language coding problem and analyzes a suitable topic from the current literature.

Prereq. EET 4370.

EET 4377 Control Engineering 1**(4 QH) Winter**

Introduces analysis of feedback control systems under both transient and steady-state conditions. Examines utilization of signal flow graphs and Laplace transforms in the formulation of block diagrams and

transfer functions for use in control system modeling. Reviews performance characteristics of feedback control systems.

Prereq. EET 4354 and MTH 4122.

EET 4378 Control Engineering 2**(4 QH) Spring**

Analyzes the stability of feedback control systems using the Routh-Hurwitz criterion. Determines roots of the system transfer function characteristic equation using the root locus method. Evaluates steady-state response using frequency plots and measurement techniques. Introduces the Nyquist criterion and methods to improve system performance through compensation.

Prereq. EET 4377.

EET 4381 Telecommunications Systems 1**(4 QH) Fall**

Presents transmission system fundamentals, beginning with the development of the information to be transmitted in the form of voice, video, or data signals. Examines information transmission, including baseband and multiplex systems. Stresses encoding analog signals into a digital format and multiplexing digital signals into the digital hierarchy. Also examines current digital transmission systems such as T-carrier, digital radio, and fiber optic systems. (Not open to electrical engineering technology majors.)

Prereq. EET 4152 or equiv.

EET 4382 Telecommunications Systems 2**(4 QH) Winter**

Introduces switching theory and practice, historical development, and circuit switching. Examines packet switching and the basics of traffic engineering. Considers time division versus space division switching, switching systems software, and digital switch architecture. (Not open to electrical engineering technology majors.)

Prereq. EET 4381.

EET 4383 Telecommunications Systems 3**(4 QH) Spring**

Continues EET 4381 and EET 4382 by examining networks comprised of switching and transmission equipment. Considers networks of particular interest to students, including the interaction between private (PABX or key systems) networks and the public (local telephone company) network. Discusses signaling systems that communicate between portions of the network. Involves developing a transmission level plan that will tie together the subject matter. (Not open to electrical engineering technology majors.)

Prereq. EET 4382.

EET 4384 Video Communications**(4 QH) Fall, Winter**

Examines the television signal, synchronization, balancing and interleaving, cameras, transmitters and receivers, video cassette recorders, video discs, and cable networks. (Not open to electrical engineering technology majors.)

Prereq. EET 4151 (may be taken concurrently with EET 4384), EET 4180, and PHY 4119.

EET 4391 Basic Optics and Optical Systems Design (4 QH) Fall

Involves developing the basics of optical imaging in the Gaussian approximation and analyzing the various designs stemming from lens aberration, intent and forms of optical systems, and flux throughput. Presents the essentials of a wave description of light along with instrumental designs for exhibiting interference and diffraction. Assumes no previous background in optics. *Prereq.* MTH 4108 and PHY 4119.

EET 4392 Optoelectronics and Fiber Optics (4 QH) Spring

Presents an overview of the various elements and their characteristics utilized in optical communication systems—elements that generate light (lasers, diodes); modulate light (as in scanning or information encoding); transfer light (optical fibers); detect light; and display and store light or its encoded information. *Prereq.* EET 4393 and MTH 4108.

EET 4393 Applied Wave Optics (4 QH) Winter

Offers a wave optical approach to classical and modern imaging, and to interference/diffraction instrumentation and devices. Emphasizes a physically descriptive analysis of such applications as non-diffractive interference effects (interferometers, interference filters, high and anti-reflection films, and longitudinal “laser” cavity modes) and diffraction effects (apertures and gratings). Also discusses wave imagery, image processing, and the 3-D imaging of holography; polarization phenomena and associated materials and devices; and basic quantum optics. *Prereq.* EET 4391, MTH 4108, and PHY 4119 or permission of instructor.

EET 4399 Special Problems in Electrical Engineering Technology (4 QH) TBA

Engages students in theoretical or experimental work under individual faculty supervision. *Prereq.* Permission of department chair.

English

ENG 4100 Critical Writing 1* (4 QH) All Quarters

(Formerly ENG 4110 3 QH.) Offers a detailed examination of the principles and methods of rhetoric, especially narration, description, and exposition. Includes frequent practice in writing paragraphs and themes in those modes. (Not open to students who have taken ENG 4110.) *Prereq.* A writing proficiency test is given at the first class meeting.

ENG 4110 Critical Writing 1 (3 QH)

This course has been replaced by ENG 4100 Critical Writing 1.

ENG 4111 Critical Writing 2* (3 QH) All Quarters

Further examines the principles and methods of rhetoric, especially persuasion and argument, the study of short fiction, and the development of research skills. Coursework includes practice in writing persuasive and critical themes and in preparing research papers. *Prereq.* ENG 4100 or equiv.

General Engineering Technology

GET 4100 Computer Programming for Engineering Technology (4 QH) All Quarters

Students write general-purpose programs in C++ language. Topics include basic data types, operations and expressions, control-flow, functions and program structure, external variables, scope rules, object-oriented programming, and C++ I/O Library. *Prereq.* MTH 4107 or concurrently.

GET 4102 Introduction to Engineering Technology (4 QH) Spring

Introduces the role of the engineering technologist in industry. Topics include engineering problem solving, engineering design, and analysis of how engineering and technology devices and concepts “work.” Introduces technical concepts through practical applications. Includes in-class experiments, group projects, and opportunities to apply both verbal and written skills. Intended to get the new student excited about engineering technology and its applications.

GET 4104 Introduction to Product Design (4 QH) Spring

Introduces the product realization process used by most successful product companies in industry. Discusses the product development process and organizations, customer needs, product specifications, generation and selection of concepts, and industrial design. Uses industry cases and provides the needed design link from design graphics and CAD to upper-level design courses. *Prereq.* GET 4371.

GET 4105 Computer Applications for Technology (4 QH) TBA

Allows students to learn the basics of computing in a microprocessor environment (DOS, Windows, Macintosh, word processing, databases, spreadsheet). Emphasizes applications relevant to technology students. Provides a foundation upon which to develop more extensive computer expertise. The skills acquired are directly transferable to subsequent courses, cooperative education assignments, and personal and professional endeavors. *Prereq.* None.

*This is a University College course offered at a different tuition rate.

GET 4110 Field Programmable Gate***Array Design (4 QH) TBA**

Builds on the concepts learned in Analog Electronics 1 and 2. Focuses on digital logic design using Field Programmable Logic Devices such as PLAs, PALs, EPLDs, PEELs, GALs, and full FPGAs from device vendors such as Altera, Xilinx, Actel, IT, and Intel. Topics include comparisons of various device architectures and topologies, design of combinatorial and state-machine logic, partitioning fitting and logic minimization, and simulation. Sharpens digital logic design skills while simultaneously training students to use today's advanced logic design tools. *Prereq. EET 4314.*

GET 4112 DOS 6.2***(4 QH) TBA**

Introduces the Disk Operating System of the IBM PC. Topics include computer hardware and terminology; care and use of floppy and hard disks; use of the basic DOS commands to locate, examine, print, copy, move, and delete files; use of subdirectories for efficient file organization; practical hard disk backup strategies; basic system configuration using CONFIG.SYS and AUTOEXEC.BAT; and the creation of batch files to simplify system operation and automate repetitive tasks. Additional topics covered as time and interest permit. Each student receives a set of utility programs that enhance the basic DOS commands. Although the focus will be on DOS 6.2, most of the course material is applicable to earlier versions of DOS and offers a logical approach to upgrading. *Prereq. None.*

GET 4114 Desktop Design with Quark Express***(4 QH) TBA**

Explores power publishing on the PC. Teaches the mechanics of style sheets, master pages, and templates, while designing outstanding documents. Emphasizes efficiency tips, design, typography, spot color, special effects, and photo placement. For either beginners or intermediate users, increases confidence, marketability, and desktop publishing skills. (Mac users welcome; the program is the same on both platforms.) *Prereq. Word-processing, DOS.*

GET 4115 The Complete Corel Draw***(4 QH) TBA**

Introduces the draw package that changed the face of PC illustration. Shows how to create and edit outlines and fills, modify and organize objects, work with clip-art and symbols, text as art, special effects, bitmaps, charting, presentations, and animations. Presents the differences between the major file formats. Finally, shows what to do with all those fonts. *Prereq. Windows, DOS.*

GET 4145 AutoCAD 1**(4 QH) TBA**

An introduction to AutoCAD for those with prior drafting experience. Begins with an overview of the IBM PC hardware and its application to computer-aided design and engineering. Demonstrates AutoCAD commands to create, edit, dimension, store, and print basic drawings. Also presents block creation and file utilities.

*Denotes the course is not transferable for credit toward an associate's or bachelor's degree program.

GET 4146 AutoCAD 2**(4 QH) TBA**

A course structured for students with prior drafting and AutoCAD experience. Following a brief review, presents the applications of polylines, blocks, line-types, layering systems, dimensioning, systems variables, and text styles. Explores the creation of symbol libraries, attributes, and attribute extraction. All projects focus on the mechanical, architectural, and facilities management disciplines. *Prereq. GET 4145.*

GET 4170 Engineering Graphics 1**(4 QH) All Quarters**

Introduces the engineering design process. Explores freehand, instrument, and computer design and drawing techniques. Topics include engineering history, descriptive geometry, orthographic projection, cut sections, developments, and pictorial drawing techniques. *Prereq. None.*

GET 4171 Engineering Graphics 2**(4 QH) Fall, Winter, Spring**

Introduces fundamentals of engineering design and analysis through architectural, mechanical, and electrical graphics. Explores graphic representation through manual and computer-aided design techniques. Topics include manufacturing and building processes, conceptual and detail design, problem solving, and patents. Requires a design project. *Prereq. GET 4170.*

GET 4173 AutoCAD for Architects and Engineers (4 QH) TBA

An accelerated course in 2-D AutoCAD skills for those with prior architectural, construction documentation, or engineering field experience. Directed toward fast-tracking AutoCAD competence for the professional user. Guides students through the entire basic AutoCAD package, forming the basis for understanding its use and application in a professional documentation/production environment. Focuses on execution of simplified simulations of real projects from various disciplines and personal portfolio development. *Prereq. GET 4171.*

GET 4174 AutoCAD Solids Modeling**(4 QH) TBA**

An extension of AutoCAD into 3-D design and modeling and more advanced topics. Topics include extrusion, wireframe modeling, surface modeling, and solids modeling, using both the Region Modeler and AME 2.1. Also covers use of Paperspace, External References, standard LISP routines, and production of slide files and slide show presentations. *Prereq. GET 4146 and GET 4171.*

GET 4175 Introduction to Design Graphics***(4 QH) Fall**

Designed for students with no previous experience in design graphics. Introduces the role of design graphics in visual communication of engineering and design ideas. Covers basic drawing principles, geometric construction, review of mathematics used in engineering drawings, orthographic projections, three-dimensional

sketching, section and auxiliary views, and assembly drawings. Briefly introduces CAD, but does not require its use. Not required for individuals with previous design graphics experience and should be replaced by an elective for use in the Graphics Certificate program. *Prereq.* None.

GET 4176 Geometric Dimensioning and Tolerancing* (4QH) Winter

Topics include general dimensioning, symbols and their uses, datums, tolerances of form, orientation, and location. Emphasizes application to drawings, interpreting symbol meaning, and the use of formulas for fasteners. Gives an overview of the advantages of positional tolerancing, cost effectiveness through proper use, inspection and gauging techniques. *Prereq.* GET 4171.

GET 4177 Advanced Dimensioning and Tolerancing* (4QH) TBA

A continuation of the study of geometric dimensioning and tolerancing topics with a brief overview of all symbols and an emphasis on runout, position, concentricity, and symmetry. Covers application of symbols to drawings, interpretation of their meaning, and the use of formulas for coaxial features. *Prereq.* GET 4176.

GET 4200 Visual Basic Programming (4QH) TBA

An introduction to Windows programming using Visual Basic 3.0. Topics include event-driven and object-oriented programming, designing applications in a graphical environment, and programming in a cooperative multitasking environment. Students will devote considerable time to assignments and completion of a programming project of their own design.

GET 4201 Advanced Visual Basic Programming (4QH) TBA

Advanced topics in Visual Basic. Builds on Visual Basic Programming and focuses on database development, OLE, and the underlying Windows architecture. Topics covered include designing relational databases and creating database front ends. Covers all aspects of OLE with Visual Basic, from implementing OLE containers to using OLE Automation. Introduces the Windows SDK and shows students how to implement many Window API calls. Additional topics introduced as they develop. Particular emphasis on preparing students to become self-sufficient application developers. Also covers access to Microsoft's Knowledge Base, how to study to become a Microsoft Certified Windows Developer, and other Windows development resources.

GET 4306 Technical Communications (3 QH) Fall, Winter, Spring

Offers an opportunity to learn the style and content guidelines for technical writing, refines technical writing skills, and develops the ability to prepare and

deliver oral presentations of a professional caliber. *Prereq.* ENG 4100 or ENG 4110.

GET 4356 Engineering Economy (4 QH) Fall, Winter

(Formerly IIS 4360.) Presents fundamental accounting concepts and terminology, including assets, liability, net worth, and the analysis of income statements and balance sheets. Discusses introductory steps in the analysis of investment proposals, time value of money, and cash flows. Analyzes cash flows in terms of present worth, annual worth, rate of return, and benefit/cost ratio. Considers depreciation and tax effects on cash flows. (Not open to students who have taken IIS 4360.) *Prereq.* MTH 4107.

GET 4364 Kinematics (4 QH) Fall

Presents the principles of kinematics through manual and computer methods to analyze and design mechanisms. Topics include four bar linkage, slider cranks, cams and followers, and gears and gear trains (reverted and epicyclic). *Prereq.* GET 4171 and PHY 4117.

GET 4393 Engineering Probability and Statistics (4 QH) Winter

(Formerly IIS 4393.) Studies the algebra of events and sets, and the laws of probability. Examines the properties of discrete and continuous random variables, including density function, expected value, variance, conditional probability, independent event, and Bayes's theorem. Presents common distributions: normal, uniform, and binomial. Also covers estimation of parameters of random variables, point estimation, confidence intervals, sampling statistics, central limit theorem, and associated sampling distributions. (Not open to students who have taken IIS 4393.) *Prereq.* MTH 4122.

Human Resources Management

HRM 4301 Organizational Behavior 1† (3 QH) Fall

Provides a fundamental presentation of the dynamics of organizational life. Emphasizes individual and interpersonal behavior in a work setting. Primary focus is on managerial applications of the organizational sciences, and includes topics such as motivation, communications, and leadership.

Industrial Management

IM 4301 Introduction to Operations Management This course's number has been changed to OM 4301.

IM 4314 Productivity Enhancement and Quality This course's number has been changed to OM 4314.

*Denotes the course is not transferable for credit toward an associate's or bachelor's degree program.

†This is a University College course offered at a different tuition rate.

Management

MGT 4101 Introduction to Business and Management 1* (3 QH) All Quarters

Studies the setting and general structure of American business, including objectives and practices affecting standard of living. Examines characteristics of private enterprise and the nature and challenge of capitalism and other forms of economic enterprise. Introduces business types, organization structure, and management functions. Examines what a managerial career involves, including problem solving and decision making. *Prereq. None.*

Management Science

MS 4332 Statistical Quality Control* (3 QH) Fall

Introduces statistical process control (SPC) and acceptance sampling used in quality control and quality assurance of products or services. Includes control charts for attributes and variables data, process capability analysis, statistical tolerancing, and acceptance sampling concepts and sampling plans for attributes. *Prereq. ECN 4251 or equiv.*

Manufacturing Engineering Technology

MFG 4311 Manufacturing Materials and Processes 1 (4 QH) Spring

This course has been replaced by MET 4380. *Prereq. CHM 4130 or CHM 4111, and PHY 4117.*

MFG 4312 Manufacturing Materials and Processes 2 (4 QH) Fall

This course has been replaced by MET 4481. *Prereq. MFG 4311 or MET 4380.*

MFG 4313 Modern Manufacturing Materials and Processes (4 QH) TBA

Covers advanced manufacturing processes and advanced manufacturing materials being utilized in industry. Topics include advanced forming techniques of materials, advanced coating methods of materials, advanced deburring techniques, advanced metal removal techniques, and advanced materials such as composites and ceramics. *Prereq. MFG 4312.*

MFG 4321 Computer-Aided Manufacturing 1 (4 QH) Fall

Gives an overview of computer-aided manufacturing (CAM), including group technology; material requirements planning; part coding and classification; numerical control; part programming; and management systems. Covers each area to instill an appreciation of the coming reality of the automated factory. *Prereq. None.*

MFG 4322 Computer-Aided Manufacturing 2 (4 QH) Winter

Continues MFG 4321. *Prereq. MFG 4321.*

MFG 4331 Computer Methods in Manufacturing Design 1 (4 QH) Fall

Investigates the use of computers in selected areas of manufacturing systems design. Topics include numerical control, MRP II, computer-aided process planning and control, and other important applications of computers to manufacturing. *Prereq. MFG 4311 and MFG 4322.*

MFG 4332 Computer Methods in Manufacturing Design 2 (4 QH) Winter

Continues MFG 4331. *Prereq. MFG 4331.*

MFG 4341 Introduction to Computer-Aided Design (4 QH) Winter

Introduces computational and numerical geometry for design, and studies the implementation of computer graphics in design and use of computer-aided design packages, as well as principles of numerical control techniques in design and manufacture. Involves a design project. *Prereq. GET 4100 or FORTRAN.*

MFG 4351 Assembly Automation (4 QH) Spring

Examines the field of automatic assembly; topics include automatic vibratory feeders, nonvibratory feeders, and the automatic orientation of parts to be fed. Also covers the economics of automatic assembly. Involves designing an automated assembly system if time permits. *Prereq. MFG 4322 and MFG 4332.*

MFG 4361 Numerical Controlled Machines (Basic) (4 QH) Fall

Begins with a week-long review of numerical controlled machines from material covered in MFG 4321 and MFG 4322. Provides an introduction to DNC and CNC systems, followed by the study of numerical controlled machines and programming in the APT programming language. *Prereq. MFG 4322, MFG 4332, and MFG 4341.*

MFG 4371 Robotics (4 QH) Winter

Discusses the concept, classification, and structure of robots and their application in manufacturing. Topics include drive and control systems; kinetics, coordinate transformations, and trajectory interpolators; and the application, programming, and integration of robots into the manufacturing environment. *Prereq. MFG 4361.*

**MFG 4381 Plant Layout and Design
(4 QH) Fall**

Examines the use of descriptive and optimizing models—for example, simulation, queuing theory, and linear programming—to design facilities and associated material handling systems. Applies computer-assisted layout analysis techniques to practical problems. *Prereq.* OM 4301 or IM 4301 and GET 4356 or IIS 4360.

MFG 4385 TQM: ISO-9000 and Quality Management (4 QH) TBA

Introduces and focuses on the ISO-9000 Series Standards and the importance the standards play in helping to establish a basic management philosophy for quality assurance. Reviews the ISO-9000 Series in depth, with emphasis on implementation, meeting compliance requirements, achieving certification, and maintaining certification. Discusses the International Standards Organization, examines the emergence of quality as a strategic business consideration, compares quality awards and quality standards, and discusses what lies ahead for ISO-9000 and quality management. *Prereq.* OM 4314 or permission of faculty adviser.

MFG 4390 Special Topics in Manufacturing Technology (4 QH) TBA

Focuses on special or advanced topic areas that are of particular interest in the manufacturing area. *Prereq.* Permission of the instructor or student adviser.

MFG 4391 Independent Study in Manufacturing Technology (4 QH) TBA

Offers theoretical and experimental work under individual faculty supervision. *Prereq.* Student must obtain a course faculty adviser.

MFG 4392 Special Problems in Manufacturing Technology (4 QH) TBA

Selected advanced problems in manufacturing technology chosen by the instructor. *Prereq.* Permission of the instructor and student adviser.

MFG 4393 Independent Study (4 QH) TBA

Selected advanced problems in manufacturing technology chosen by the instructor. *Prereq.* Permission of the instructor and student adviser.

Mathematics

**MTH 4006 Technical Mathematics
(4 QH) All Quarters**

Reviews high school algebra equations, formulas, exponents, polynomials, factoring, scientific notation, fractions, radicals, quadratic equations, and linear equations and their applications. Students are required to purchase a TI-85 graphing calculator or equiv. (Credit cannot be used in the associate in engineering, associate in science, or the bachelor of science in engineering technology degree programs.) *Prereq.* None.

**MTH 4107 College Algebra
(4 QH) All Quarters**

Examines laws of exponents, factoring, operations with fractional expressions, radical and complex numbers, Pythagorean theorem and distance formula, linear and quadratic equations and inequalities, and functional notation. Includes graphing of a wide variety of functions and equations, including lines, conic sections, and polynomials. Studies solutions to many types of equations, including linear, quadratic, and polynomial. Also explores many applications of algebra. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4006 or equiv. in high school algebra.

**MTH 4108 Pre-Calculus
(4 QH) All Quarters**

Studies exponential and logarithmic functions, trigonometric functions of angles in degrees and radians, trigonometric identities and equations, right triangles, law of sines and cosines, inverse trigonometric functions, and polar coordinates. Examines complex numbers in trigonometric form, systems of linear and nonlinear equations, binomial theorem, arithmetic, and geometric sequences and series. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4107.

**MTH 4120 Calculus 1
(4 QH) All Quarters**

Studies general function operations, theory and evaluation of limits, derivatives of algebraic and trigonometric functions, general rules of differentiation, Rolle's theorem, and Mean Value theorem. Also covers application of differentiation including velocity; and acceleration, related rates, maximum, minimum, curve sketching, and approximations by differentials. Examines antiderivative as an introduction to integration. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4108.

**MTH 4121 Calculus 2
(4 QH) All Quarters**

Examines the Riemann sum and the development of the fundamental theorem with applications to areas, volumes, and rectilinear motion problems. Topics include logarithmic, exponential, and inverse trigonometric functions and their applications; techniques of integration, including parts, partial fractions, substitution, and the use of tables; numerical integration (Simpson's and Trapezoidal rules); L'Hopital's rule; improper integrals; and geometry of vectors in a plane and space. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4120.

**MTH 4122 Calculus 3
(4 QH) All Quarters**

Studies sequences and series to the development of Taylor and Maclaurin series, three-dimensional space, and a treatment of functions of several variables; multiple integrals with applications in areas and volumes; and differential equations, including the solution with

applications of first-order with variables separable, first-order linear, and second-order linear homogeneous to complete the sequence. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4121.

MTH 4123 Differential Equations

(4 QH) Fall, Winter, Spring

Examines linear differential equations with constant coefficients, homogeneous and nonhomogeneous. Explores the variation of parameters and undetermined coefficients and simultaneous differential equations, the Laplace transform, series solution of differential equations, and the Fourier series. Studies orthogonal functions and numerical solutions of differential equations. Students are required to purchase a TI-85 graphing calculator or equiv. *Prereq.* MTH 4122.

MTH 4196 Math for Engineering Technology

(4 QH) Spring

Concentrates on the mathematical methods of most use to technologists and engineers: the study of two-dimensional iterated integrals; first- and second-order linear ordinary differential equations; statistics of large and small samples drawn from a normal distribution. Use is made of computer packages, including EXCEL for statistics and a solver and grapher for ordinary differential equations. *Prereq.* MTH 4121.

Mechanical Engineering Technology

MET 4301 Mechanics A

(4 QH) Fall

Studies the forces, moments, couples, and statics of particles and rigid bodies in two and three dimensions. Examines external and internal distributed forces, first moments and centroids, as well as structure-trusses, frames, and machines. *Prereq.* MTH 4120 and PHY 4117.

MET 4302 Mechanics B

(4 QH) Winter

Explores friction and moments of inertia; the kinematics of particles; force, mass, and acceleration; work and energy. *Prereq.* MET 4301.

MET 4303 Mechanics C

(4 QH) Fall

Studies the impulse and momentum of particles; the kinematics of rigid bodies, force, mass, and acceleration; and the dynamics of rigid bodies. Also covers introduction to mechanical vibration. *Prereq.* MET 4302.

MET 4314 Stress Analysis A

(4 QH) Winter, Spring

Examines axially loaded members, stress and strain, allowable stresses, factor of safety, temperature effects, and indeterminate members. Other topics include shear and moment diagrams; flexural and transverse shearing stresses in beams; torsional stresses and deformations; and power transmission. *Prereq.* MET 4301.

MET 4315 Stress Analysis B

(4 QH) Fall, Spring

Presents determinate and indeterminate beam deflections and reactions by various methods, including integration and moment-area and superposition methods. Topics include thin-walled pressure vessels and centric loading of bolted and welded connections; eccentric loads on beams and riveted and welded joints; combined stresses; principal stresses; Mohr's circle; theories of failure; and column design. *Prereq.* MET 4314.

MET 4319 Mechanics

(4 QH) Spring

Provides an introduction to mechanics for non-mechanical majors. Studies the static analysis of forces acting on particles and rigid bodies in two and three dimensions. Also discusses centroids and centers of gravity and moments of inertia. Considers the kinematics and kinetics of particles and rigid bodies. *Prereq.* MTH 4120 and PHY 4117.

MET 4330 Mechanical Design A

(4 QH) Winter

Introduces the principles of mechanical design, the design process, design factors, creativity, optimization, human factors, and value engineering through simple design projects. Examines principles of design, properties, and selection of materials; stress concentrations; strength under combined stresses; theories of failure; impact; and fluctuating and repeated loads. *Prereq.* MET 4314 and MET 4380.

MET 4331 Mechanical Design B

(4 QH) Spring

Continues MET 4330 and further develops the methodology of design as applied to products, processes, and equipment. Also studies the deformation and design of fasteners, screws, joints, springs, and bearings; lubrication; and journal bearings. Covers stresses and power transmission of spur, bevel, and worm gear; shaft design; and clutches and brakes. *Prereq.* MET 4330.

MET 4333 Design Laboratory

(2 QH) Spring

Provides students the opportunity to develop group design projects as part of their senior design course MET 4330 and MET 4331. Students present completed projects to their peers and to the faculty. Must be taken in conjunction with MET 4331.

**MET 4340 Thermodynamics A
(4 QH) Winter**

Introduces the general theory of heat and matter; first law of thermodynamics for open and closed systems (law will be applied to nozzles, turbines, compressors, and heat exchangers); energy-transformation principles and availability of energy; and properties and processes for pure substances, liquids, and ideal gases. Also covers thermodynamic properties using tables and charts; mixtures of fluids; and vapor cycles. *Prereq. CHM 4103 or CHM 4111 and PHY 4118.*

**MET 4341 Thermodynamics B
(4 QH) Winter**

Discusses the second law of thermodynamics for open and closed systems; internal combustion engines; design and performance of steam and gas turbines; gas power cycles; vapor and combined power cycles; cogeneration cycles; and refrigeration cycles. *Prereq. MET 4340.*

**MET 4342 Refrigeration and Air-Conditioning
(4 QH) Spring**

Introduces air-conditioning principles, including psychometrics and heat pumps. Topics include calculation of heating and cooling loads in accordance with ASHRAE practices; principles of gas compression; analysis of vapor compression; refrigeration systems; low-temperature refrigeration cycles; and absorption refrigeration systems. *Prereq. MET 4341.*

**MET 4343 Heat Transfer
(4 QH) Fall**

Presents the basic principles of heat transfer: thermal conductivity and thermal conductance/resistance. Examines heat transfer mechanisms, the basic equations of conduction, and natural and forced convection. Other topics include the radiation between simple bodies, heat transfer coefficients, heat exchanger effectiveness, and regenerative and evaporative heat exchangers. *Prereq. MET 4341.*

**MET 4373 Fluid Mechanics
(4 QH) Winter**

Covers the principles of fluid statics and dynamics. Topics include fluid flow in pipes, friction losses, fluid energy, Bernoulli's theorem, flow measurement, open channel flow, pump and fan design and selection. Replaces MET 4370 and MET 4371. *Prereq. MET 4302.*

**MET 4380 Materials A
(4 QH) Winter, Spring**

Identifies methods of selection of materials for engineering applications. Topics include fundamental metallic, ceramic, and polymer structures; general information covering theoretical aspects of properties; testing and failure of materials; alloying and hardening of metals; refinement of metals; equilibrium diagrams; characteristics of engineering metals; and introduction to principles of metal fabrication. *Prereq. None.*

**MET 4388 Measurements and Analysis
(5 QH) Fall**

Examines the theory of mechanical measurements, instrumentation, and experimentation data and report writing. The principles developed in class are applied in the laboratory, and a detailed technical report will be required. Laboratory experiments include topics such as experimental analysis, statistical techniques, mechanical measurements of temperature, pressure, force, deformation, strain, and rotational frequency. *Prereq. MTH 4396, GET 4105, and PHY 4118.*

**MET 4390 Measurement and Analysis
Laboratory (3 lab, 2 QH)**

This course has been replaced by MET 4388 Measurement and Analysis 1 and MET 4389 Measurement and Analysis 2.

**MET 4391 Mechanics Laboratory
(3 lab, 2 QH) Fall, Spring**

(Formerly Technology Laboratory A.) Conducts experiments to determine mechanical properties of materials under normal and abnormal environmental conditions. Experiments include tension, bending, torsion, creep, and fatigue. *Prereq. MET 4315, MET 4380, and MET 4389 or MET 4390.*

**MET 4392 Fluid Mechanics Laboratory
(3 lab, 2 QH) Winter**

(Formerly Technology Laboratory B.) Conducts experiments to determine the physical properties of incompressible fluids, measure flow rates and velocities utilizing pitot tubes, orifice plates, venturii meter, and weirs flow meters, U-tube differential manometers, and piezometers. *Prereq. MET 4370 (may be taken concurrently) and MET 4389 or MET 4390.*

**MET 4393 Thermal Analysis Laboratory
(3 lab, 2 QH) Fall, Winter**

(Formerly Technology Laboratory C.) Explores basic thermodynamic relationships. Conducts experiments to examine the flow of steam and to examine the energy conversion of a fuel into a working substance. Examines related heat transfer mechanisms along with operating characteristics of thermal generators, engines, and compressors. Evaluates internal combustion engines and their characteristics. *Prereq. MET 4341 and MET 4389 or MET 4390.*

**MET 4395 Mechanical Projects Laboratory
(3 lab, 2 QH) Spring**

(Formerly Technology Laboratory E.) Offers advanced and specialized experiments in mechanical engineering topics. Includes group term project. *Prereq. MET 4342, MET 4343, and MET 4389 or MET 4390.*

**MET 4414 Mechanical Vibrations
(4 QH) TBA**

Studies the elements of vibrating systems, one degree of freedom, natural frequencies, and damped free and forced vibration. Presents design of vibration absorbers for industrial equipment. Requires a design project and lab experiments. *Prereq. MET 4303.*

MET 4416 Stress Analysis C**(4 QH) TBA**

Discusses curved beams, nonsymmetrical bending of beams, shear center and shear stresses on thin sections, and composite beams. Also covers columns, energy absorption and resilience, inertial stresses, impact loading, deflection of beams by energy methods, and bolted fastenings. *Prereq.* MET 4315.

MET 4444 Power Generation**(4 QH) TBA**

Explores electrical power generation by thermo-mechanical, electromechanical, nuclear, and hydraulic systems. Emphasizes the analysis of thermodynamic cycles as well as the practical deviations from the related ideal processes. Considers accessory and auxiliary equipment used in such systems. Studies design, performance, economic factors, and public issues affecting electric power generation. *Prereq.* MET 4341.

MET 4481 Materials B**(4 QH) Spring**

Discusses polymer, composite, and ceramic materials; electrical and magnetic properties; and applications for the fabrication and use of both metals and non-metals. Examines structures of metals, imperfections, and properties of nonferrous metals. Discusses fabrication methods, including powder metallurgy, metal-working, casting, molding, machining, welding, and manufacturing methods. Offers experiments in preparation of samples and microstructure/analysis, and additional lab work in the construction of cooling curves and binary phase diagrams. *Prereq.* MET 4380.

MET 4482 Applied Metallurgy**(4 QH) TBA**

Examines mechanical properties of ferrous metals, the iron carbon diagram, high-temperature alloys, hardening methods, impact tests, and the effects of environment. Also discusses manufacturing processes and methods of fabrication. Offers experiments in heat treatment and surface corrosion, as well as ferrous and nonferrous metals. *Prereq.* MET 4481.

Operations Management

(Formerly Industrial Management: IM)

OM 4301 Introduction to Operations**Management* (3 QH) TBA**

(Formerly IM 4301.) Presents concepts and principles related to operations from a managerial point of view. Examines relationships to other business functions. Explores operations as a transformation process, with inputs of materials, investment, and people producing finished goods and services. Topics include product and process design, forecasting demand, capacity planning, facilities design, aggregate planning, scheduling, and quality control and assurance. (Not open to students who have taken IM 4301 or IM 4401.) *Prereq.* MS 4325.

OM 4314 Productivity Enhancement and Quality* (3 QH) TBA

(Formerly IM 4314.) Explores the fields of quality control and productivity from managerial, technological, behavioral, and economic perspectives. Examines the practical improvement of operations. Introduces current productivity improvement programs, including measurement and control. Reviews management practices of modern quality control and explores new approaches. Includes the economics of total quality, internal and external quality, and long-term quality and reliability management. (Not open to students who have taken IM 4314.) *Prereq.* None.

Physics**PHY 4101 College Physics 1****(4 QH) Fall, Summer**

Introduces students to mechanics, including units of measurement, vectors, accelerated motion, and Newton's laws of motion. Topics include conservation of energy, work, momentum, elements of heat, mechanical waves, and vibrating bodies. Includes laboratory experiments and classroom demonstrations as an integral part of the course. (This course is intended for health professions and science programs and cannot be used for credit toward technology degrees in The Lowell Institute School.) *Prereq.* MTH 4107 or equiv.

PHY 4102 College Physics 2**(4 QH) Winter, Summer**

Introduces magnetism, magnetic fields, electromagnetic induction, electrostatics, and electric circuits. Discusses appropriate topics in optics, nuclear and atomic physics. Involves frequent laboratory experiments and classroom demonstrations. (This course is intended for the health professions and science programs and cannot be used for credit toward technology degrees in The Lowell Institute School.) *Prereq.* PHY 4101.

*This is a University College course offered at a different tuition rate.

PHY 4117 Physics 1**(4 QH) All Quarters**

Introduces vectors and balanced forces, accelerated motion, projectile motion, Newton's laws, work and energy, momentum, and equilibrium of rigid bodies.

Prereq. MTH 4107 or concurrently.

PHY 4118 Physics 2**(4 QH) All Quarters**

Explores rotational motion, periodic motion, electric forces and fields, electric potential, capacitance, electromotive force, and direct current circuits.

Prereq. PHY 4117.

PHY 4119 Physics 3**(4 QH) All Quarters**

Covers magnetic fields and forces, electromagnetic induction, inductance, Gauss's law, electromagnetic waves, mechanical waves, sound, and the interference and diffraction of light. *Prereq. PHY 4118.*

PHY 4196 Physics Laboratory 1**(1 QH) All Quarters**

Includes experiments in acceleration, force, circular motion, energy, and momentum that follow lecture topics in PHY 4117. *Prereq. PHY 4117 concurrently.*

PHY 4197 Physics Laboratory 2**(1 QH) All Quarters**

Includes experiments in statics, rotation, simple harmonic motion, and oscillation that follow the lecture topics in PHY 4118. *Prereq. PHY 4196 and PHY 4118 concurrently.*

PHY 4198 Physics Laboratory 3**(1 QH) All Quarters**

Includes experiments in circuits, electromagnetism, optics, and waves that follow the lecture topics in PHY 4118 and PHY 4119. *Prereq. PHY 4197, PHY 4118, and PHY 4119 concurrently.*

Northeastern University



A Profile of Northeastern

At Northeastern University, we value part-time evening and weekend students as highly as we do our full-time students. You are important members of the academic community and reflect the changing profile of today's college student, which encompasses new concerns for lifelong learning and professional retraining. Northeastern supports your pursuit of personal and professional goals and wants to contribute to your success. In return, you contribute to the intellectual and cultural diversity upon which this urban institution thrives. You take full advantage of the academic resources and facilities we offer and join all our students who are recognized and supported by the University's faculty and administration.

Founded in 1898, Northeastern University is incorporated as a privately endowed, nonsectarian institution. From its beginning, the University's mission has been to identify and address the educational needs of a diverse community and student body in distinctive and useful ways. Northeastern did not duplicate the programs of other academic institutions, but instead became a world leader in new areas of educational service. Today, the University is comprised of seven undergraduate colleges and nine graduate schools. Our undergraduate colleges are:

- Bouvé College of Pharmacy and Health Sciences
- College of Arts and Sciences and School of Journalism
- College of Business Administration
- College of Computer Science
- College of Criminal Justice
- College of Engineering, including the School of Engineering Technology and The Lowell Institute School
- College of Nursing

Our graduate schools are:

- Graduate School of Arts and Sciences and School of Journalism
- Bouvé College of Pharmacy and Health Sciences Graduate School
- Graduate School of Business Administration
- Graduate School of Computer Science
- Graduate School of Criminal Justice
- Graduate School of Engineering

- Graduate School of Nursing
- Graduate School of Professional Accounting
- School of Law

At Northeastern, we respond to the needs of people who already hold jobs or are launched in careers but who wish to advance or change their professional lives. There are also classes for people pursuing personal interests. The University offers a variety of educational options—both credit and noncredit—to suit your particular objectives. The Lowell Institute School offers part-time evening and weekend associate's and bachelor's degree programs in technological areas, in addition to daytime undergraduate programs. University College, so named because it draws upon the resources of Northeastern's other colleges, offers part-time day and evening programs leading to certificates and to associate's and bachelor's degrees.

All formal courses of study leading to degrees through part-time programs are approved by the full-time day faculty of Northeastern's Basic Colleges and are governed by the same qualitative and quantitative standards.

Where You'll Find Northeastern

The main campus of Northeastern University is a vibrant and progressive urban community. To all Northeastern students, the physical setting of the Boston campus extends opportunities to participate in the dynamic, exciting environment that we share with city residents. Built around a quadrangle, the campus is divided by Huntington Avenue, a major artery. It is located in the midst of such cultural landmarks as Symphony Hall, the Museum of Fine Arts, the Isabella Stewart Gardner Museum, Horticultural Hall, and the Boston Public Library. You can walk to Frederick Law Olmsted's Fenway Park, Copley Place, the Back Bay shopping district, and a number of internationally renowned hospitals. In 1910 the University began construction on the first piece of land acquired at its present site; it is now more than fifty-seven acres.

The Boston campus is ideally situated for easy commuting. The MBTA Orange and Green lines provide rail service to the heart of the campus. Use either the Orange Line's Ruggles Street station or the Green Line's Northeastern University stop along the Heath Street Branch to arrive on campus. The MBTA also has numerous bus routes that run along Huntington and Massachusetts avenues, which are the two major city streets closest to the campus. Finally, if you drive to Northeastern, student parking is available at reasonable rates in University-owned parking lots.

To reach increasing numbers of students and to make participation in our programs as convenient as possible, Northeastern University has established a number of suburban campuses and branch locations, as well as several off-campus athletic facilities. The campuses and branch locations house administrative and classroom facilities for Northeastern's graduate, part-time day and evening, and continuing education programs. The University also maintains many affiliations to ensure access to facilities and specialized equipment available at other institutions and organizations.

One of Northeastern's most recent acquisitions is the twenty-acre Dedham campus, just north of Route 128. This facility houses the Center for Continuing Education and space for the College of Business Administration's High Technology MBA Program.

Near the junction of routes 128 and 3 in Burlington is the Suburban campus of Northeastern University. Part-time undergraduate courses in a variety of subject areas and part-time graduate courses in engineering and business administration are offered. The Burlington campus also offers special programs for part-time, evening, and noncredit continuing education courses.

Situated on 165 acres of wooded, lakeside land in Ashland, the Warren Conference Center offers meeting space for groups of up to 150 people. Overnight group retreats and special events can be held at the center. Recreational activities available to conferencing groups include tennis, swimming, volleyball, and soccer.

Twenty miles northeast of Boston, the Marine Science and Maritime Studies Center is located in Nahant, on Massachusetts Bay. It serves as a site for national, international, and University research.

Henderson House is located twelve miles from Boston in suburban Weston. This facility hosts a variety of activities, including residential

seminars, workshops, short courses, and weekend meetings.

Network Northeastern

Network Northeastern uses the microwave-based Instructional Television Fixed Service (ITFS) system to broadcast courses to subscriber companies and to the Burlington and Dedham campuses. The network telecasts live classroom instruction to remote sites where students interact with instructors via a telephone-based talkback system. A courier service collects and delivers course materials and serves as the off-campus student's link to academic and administrative departments.

Network Northeastern currently broadcasts educational programs to over thirty local corporations. Courses are offered in graduate engineering, graduate computer science, undergraduate engineering technology, and University College. Network Northeastern also delivers graduate level and short courses to corporations throughout the United States via satellite.

University Libraries

Together, the collections, services, staff, and facilities of the Northeastern University Libraries provide access to information and an understanding of the organization of the literature and other information resources of the academic disciplines. The library is integral to the academic and research processes, whether these occur in a formal classroom, seminar, or laboratory setting or through individual study and enrichment.

All students, whether full-time or part-time, have full access to all units of the University Libraries located on the Boston and Burlington campuses and at the Marine Science Center in Nahant.

Snell Library, a centralized library for the Boston campus, is open more than 100 hours each week that classes are in session. It has 2,800 seats on five levels and shelving for more than 1.25 million volumes. Library services incorporate online, telecommunication, and media technologies that are associated with information resources, including an online cata-

log and circulation system, microcomputer and language laboratories, and a CD-ROM optical disc network.

Total holdings of the University Libraries include more than 810,000 volumes; 1,850,000 microforms; current subscriptions to over 8,700 serials and newspapers; 250,000 government documents; and 14,000 audio, video, and computer software titles.

Library staff are available in all service areas to assist students, including students with disabilities. Librarians provide instruction to groups and to individuals on the bibliographic research process and on strategies for identifying, locating, and using information resources. Each term, a series of tutorials is offered giving students further opportunities to meet with a librarian to discuss particular or specialized research needs.

Northeastern University is a member of the Boston Library Consortium, a cooperative arrangement among the following academic and research institutions: Boston College, Boston Public Library, Boston University, Brandeis University, Brown University, Marine Biological Laboratory/Woods Hole Oceanographic Institution, Massachusetts Institute of Technology, Northeastern University, the State Library of Massachusetts, Tufts University, the University of Massachusetts (Amherst, Boston, Dartmouth, and Lowell campuses), and Wellesley College. The University's membership in the Boston Library Consortium generally allows for on-site use by, but does not grant borrowing privileges to, students at Northeastern. Some of the consortium libraries may require that a visiting student present Northeastern University identification during peak periods of use. A Northeastern reference librarian can advise about such student visitor policies.

Engineering Computer Center

The Engineering Computer Center provides user support for Northeastern Engineering, Engineering Technology, and Lowell Institute School students and faculty. The staff are full-time professionals who administer the systems, deliver training, maintain hardware and provide software support. The center's labs, open seven days a week with competent user assistants available to answer questions, provide access to NUnet, a University-wide network, and the Internet, a global network. These networks

provide access to software for educational and research application in a variety of engineering disciplines. The hardware is distributed among 486 PCs, Macintoshes, and UNIX workstations.

Division of Academic Computing

The Division of Academic Computing (DAC) provides technical support for the University's academic and research computing environment, and an efficient, reliable University-wide communications network (NUnet) for students, faculty, and staff.

DAC maintains the *lynx* communication system for all members of the University community. This system gives users access to e-mail, Usenet news groups, and the Internet, free of charge. In addition, students may create and maintain World Wide Web home pages on *lynx*. To apply for a *lynx* account, bring a valid Northeastern student identification card to 40 Richards Hall during business hours.

DAC also maintains computer laboratories equipped with both PCs and Macintoshes throughout the campuses. These labs give students access to productivity and instructional software applications, University information services, and the Internet.

Additional DAC resources include the Multimedia Center, the VAX faculty research cluster, and ResNet, which makes the Internet available to students in their residence hall rooms.

Student Center

The Student Center is home to Northeastern's 185 student organizations—coordinated by the Student Activities Office—and Student Government offices, the Information Center, the Indoor Quad, *The Northeastern News*, the yearbook, WRBB radio station, and the food court. Supported by student fees, the center also houses a computer lab, meeting rooms, lounges, the Commuter Services Office, a game room, the ballroom, Mailboxes, Etc., and a Supercuts.

The Student Center offers a comfortable setting for the entire campus community and hosts many of the social, recreational, academic, and cultural activities held on campus.

The Student Center is open seven days a week (six days in the summer) for students to drop by before or after class, relax with friends, attend a club meeting or program, grab a bite to eat, or shoot a game of pool. For more information, call 617-373-4335.

Recreational Facilities and Programs

University College and Lowell Institute School students have access to both the Marino Recreation Center and the Cabot Physical Education Center, which are administered by the Office of Intramural and Recreational Sports. The Marino Recreation Center, a new state-of-the-art sport and recreational facility, includes a multi-purpose gymnasium with basketball, volleyball, and badminton courts; a three-lane suspended jogging track; an aerobics, martial arts, and dance studio; and free-weight and selectorized-weight areas. The Fitness Area features cardiovascular fitness equipment such as stairclimbers, rowing ergometers, treadmills, cross-country ski machines, and upright and recumbent bikes. The Cabot Center houses the swimming pool, racquetball/wallyball courts, and an indoor track for soccer and tennis.

In addition, the Intramural Office offers league competition in basketball, broomball, flag football, ice hockey, racquetball, indoor soccer, softball, tennis, and volleyball. An aerobics program is also offered throughout the year. The registration fee, paid quarterly, entitles students to unlimited participation in the sixteen to twenty-four classes that are scheduled weekly. To use the Marino and Cabot recreational facilities and programs, enrolled students must show their Northeastern University ID cards and a photo ID, if applicable. For more information, contact the Intramural Office at 617-373-4433.

Social and Professional Clubs

We welcome and encourage part-time students in The Lowell Institute School and University College to join in the social and professional activities that are organized and run by the student body, with the assistance of the director of the Office of University College–Lowell Institute School Student Activities. If you and your peers are interested in starting new professional clubs,

the office will help to plan and organize locally and nationally.

All programs are designed to keep pace with changing student needs and interests and to provide maximum opportunity for your participation.

Disability Resource Center

The Disability Resource Center's (DRC) mission is to enable people with disabilities equal access to higher education via support services and advocacy. The center provides support services on an individual basis. Accommodations include but are not limited to: orientation, quarterly registration assistance, counseling, referral, and HP parking.

Before receiving services, individuals must voluntarily register their disability-related needs with the DRC. Registering requires providing the DRC with recent diagnostic documentation of their disability. The center's services are individually designed to meet the student's needs.

The Counseling Center

Confidential counseling and testing are available to full- and part-time students to address career, educational, or personal concerns. Assistance is available to all students during days and one weekday evening until 7:30 PM at the Counseling Center. For information and appointments, call 617-373-2142 or drop in at 302 Ell Building.

Lane Health Center

Lane Health Center offers primary health care to all full-time undergraduate students and to those graduate students who have paid a student health fee. Located at 135 Forsyth Building, the center is open Monday–Friday, 9 AM–7 PM, and Saturday, 9 AM–1 PM. Students should call 617-373-2772 to schedule an appointment with a primary care clinician for routine care and for the assessment, treatment, and follow-up care of an acute or chronic medical condition. The Lane Health Center does not accept students on a walk-in basis except for those requiring urgent care. Students with urgent medical problems who do not have an appointment are seen on a

first-come, first-served basis. For medical care after hours, New England Baptist Hospital provides services to Northeastern University students. Students requiring medical attention when the Lane Health Center is closed should call 617-738-5830 ext. 5544. Students are financially responsible for all services rendered at New England Baptist Hospital.

Before matriculating, all students must return a completed health and immunization form at least thirty days prior to the first day of classes, or their class registration will be blocked. Massachusetts College Immunization Law requires documentation of immunity to certain diseases. To obtain a form and for more information on immunization requirements, contact the Lane Health Center at 617-373-2772.

Department of Career Services

The Department of Career Services provides a variety of professional development services to Northeastern students and alumni/ae. The services enable students to plan for career advancement. Students already working in their chosen fields may receive assistance in identifying career paths and developing a network of professional contacts. Others may receive assistance with career placement.

Services available to students and alumni/ae include career counseling, job search seminars, career expos, and resume matching. Students and alumni/ae may use the Career Resource Center, which contains valuable career planning material, a job bank of employment opportunities, the Northeastern National Career Network, and files on over 1,200 companies.

The On-Campus Recruiting program offers students receiving a bachelor's degree in the current academic year the opportunity to interview on campus with representatives of business, industry, government, and nonprofit organizations. Over 250 employers conduct interviews on campus during the fall and winter recruiting seasons.

The department is located on the Boston campus in 101 and 103 Stearns. Counselors are available to students and alumni/ae by appointment. Office hours from September to June are 8:30 AM–4:30 PM Monday, Thursday, and Friday; and 8:30 AM–7:00 PM on Tuesday and Wednesday. Office hours during July and August are 8:00 AM–5:00 PM Monday and Thursday;

8:00 AM–7:00 PM Tuesday and Wednesday.

For further information or an appointment, call 617-373-2430 (voice), 617-373-2432 (TTY).

Cooperative Plan of Education

The University is known worldwide for its cooperative plan of education, under which students alternate periods of paid, professional work and study. Our time-tested, widely acclaimed method of education enables students to gain valuable hands-on, practical experience in their chosen fields as an integral part of their college programs. All of Northeastern's undergraduate day colleges operate on the cooperative plan, and several of the University's graduate schools have structured their programs to include the features of cooperative education.

Alumni Association

Upon graduation, you will join the more than 130,000 alumni/ae united worldwide within the Alumni Association, which was established to promote a mutually rewarding relationship between Northeastern and its graduates.

Association activities include the Homecoming celebration, NU Night at POPS, the Downtown Breakfast Club Series, presentation of the Outstanding Alumni Awards, and the annual presentation of Professional Promise Awards to outstanding seniors in each of the colleges. Free Alumni Association Membership Cards provide access to University facilities. Call the association at 617-373-3186.

Administrative Information

Admissions

The Student Body

The student body of The Lowell Institute School is composed of both recent high school graduates and adults. Most students are employed in industry, with a range of vocational experience. They represent many technical career categories—industrial, engineering, scientific, and allied-medical—demonstrating that, in our increasingly complex society, the key to personal advancement is education.

Academic Background

A firm knowledge of the fundamentals of mathematics and science is necessary for success in the more advanced technological courses.

All applicants to The Lowell Institute School are required to be proficient in both English and mathematics. To enroll in ENG 4100 Critical Writing 1 or MTH 4107 College Algebra, you must satisfactorily complete an English and a mathematics skills test.

Students who lack the required English or mathematics skills must take the appropriate review course. In addition, students who feel uncomfortable with the level of their English or mathematics skills are encouraged to enroll in review courses as well. The next paragraphs describe the review courses available. The review courses are not for credit toward degree requirements.

ENG 4005, ENG 4006, and ENG 4007 English for International Students 1–3

This is a three quarter sequence of courses for nonnative English speakers that provides intensive training in the English language. Students are introduced to English grammar, with an emphasis on listening, speaking, and writing. The preparation of written and oral reports, as well as business and social correspondence, is required. In the final quarter, advanced work in written and spoken English prepares the students for ENG 4100 Critical Writing 1.

ENG 4011 Elements of Writing

This is a writing course that reviews English grammar and offers practice in writing sentences, paragraphs, and short papers. The course prepares students for ENG 4100 Critical Writing 1.

MTH 4006 Technical Mathematics

This is a mathematics course that reviews high school algebra and prepares students for MTH 4107 College Algebra.

Program Counseling

If you are attending The Lowell Institute School for the first time, we recommend that you meet with a program counselor, who will assist you in planning an academic program. (If possible, please bring school transcripts to the counseling session.) Counselors are available evenings and Saturdays at the main campus in Boston most of the year; a special schedule is prepared for the summer. Counseling at the Burlington and Dedham campuses is available on selected evenings during the registration period prior to each quarter. For further information, contact The Lowell Institute School at 617-373-2500.

Special Students

Our open enrollment policy allows you to enroll in courses without making a formal application. As long as you have the proper prerequisites or their equivalent, you can enroll as a special student.

Degree Candidates

To graduate from The Lowell Institute School you must be accepted as a degree candidate in a program. An application for degree candidate status is available from The Lowell Institute School office in Boston (120 Snell Engineering Center, 617-373-2500).

To declare a major, you must do the following.

1. Complete sixteen quarter hours in The Lowell Institute School degree program at a minimum cumulative quality-point average of 2.00 (a grade of C).
2. Present a high school diploma or its equivalent (GED).

Once your application for admission to a degree program is approved, a change of status will be recorded on your permanent record and any advanced standing credit will be posted.

Full-Time Students

In addition to the part-time programs described in this publication, full-time day cooperative education programs are offered through the School of Engineering Technology. Interested students can apply through the Office of Undergraduate Admissions, 617-373-2200.

Readmission

If you are a former student seeking readmission to The Lowell Institute School, we suggest you schedule a meeting with a program counselor to determine how program changes may affect course requirements. We recommend that you bring a copy of your previous curriculum worksheet and a transcript.

Transfer Students and Advanced Standing Credits

If you are transferring from a community college, junior college, technical institute, or other college or university, you may transfer applicable credits toward the degree requirements of a program in The Lowell Institute School.

If you are admitted with transfer or advanced standing credits from another institution, you must meet the requirements for admission as set forth under the regulations stated. (See "Degree Candidates," page 61.) Advanced standing in The Lowell Institute School may be obtained by transfer of credits, by proficiency examination, or by completing the College Level Examination Program (CLEP).

Transfer of Credits

You may receive, subject to the approval of the Academic Standing Committee, credits for academic work completed in other approved schools, colleges, or universities if the following criteria are met: the content of the course being submitted is equivalent to that of the corresponding course at The Lowell Institute School; the grade achieved in the course submitted is C or higher; and the remoteness of the time of study does not negate its use as a prerequisite for an advanced course.

If you desire advanced standing credits by transfer, you must file a petition for transfer credit. You should ask the registrar of the institutions previously attended to mail an official transcript to The Lowell Institute School, 120 Snell Engineering Center, Boston, Massachusetts 02115.

Proficiency Examinations

If you are a degree candidate in good academic standing and you do not meet all the criteria for the normal transfer of credits but are able to supply evidence of sufficient knowledge of a technical subject, you may petition for a proficiency examination. Knowledge can be demonstrated through job experience or by completing noncredit continuing education courses such as those offered by Northeastern's Building Design and Construction or State-of-the-Art programs. After paying the proficiency examination fee and demonstrating proficiency as indicated by the examination, you will receive advanced standing credit. For information on the limits set for proficiency examinations, contact The Lowell Institute School, 617-373-2500.

College Level Examination Program

The Lowell Institute School awards college credit under the College Level Examination Program (CLEP). This program is designed to enable individuals who have reached college-level education to demonstrate their achievement through testing and to receive college credit applicable toward a degree program. (The examination measures basic proficiency in the arts and sciences.) After paying the exam fee and receiving a passing score, you will be awarded advanced standing credit. For further information, contact The Lowell Institute School, 617-373-2500.

Registration

Selecting Courses During Registration

Courses offered by The Lowell Institute School are listed in the "Course Descriptions" section of this *Bulletin*. (See page 37.) Part of each course's entry lists in which quarters the course is offered. Because most courses are not offered every quarter, you should plan your course load for the entire academic year, not just the next quarter. Academic counseling is available to help plan your course load for the year. If you need help, contact a Lowell Institute School program counselor at 617-373-2500.

Guidelines for Registering for Electives

Many of The Lowell Institute School degree programs require the completion of electives. The electives give you the chance to explore topics beyond the core curriculum's scope or to gain expertise in a specific area introduced by the core courses.

There are three categories of electives: open, technical, and social science/humanities.

Open Electives

Any course is acceptable as an open elective except physical education, military science, and preparatory courses. An open elective may be either a three or a four quarter-hour course depending on your major.

Social Science/Humanities Electives

Social science/humanities electives are offered through University College and must be chosen from a list that is available from The Lowell Institute School. Six quarter hours of the social science/humanities electives must be chosen from the communication studies (CMN) category for certain majors.

Technical Electives

Technical electives must be chosen from the list of suggested technical electives appearing at the end of the degree curricula. Students wishing to take an upper-level course that does not appear on the list must petition for permission before attending the class. Students should submit a proposed program of elective courses for approval by the program coordinator. Electives preferably represent a minor field of concentration consistent with personal career objectives.

Registration Periods

Official registration periods are scheduled for each quarter during the academic year. We strongly recommend that you register for courses during these periods. The registration dates, times, and locations are listed in the enclosed Fee Schedule and Academic Calendar.

Before the registration period begins, get a copy of the *University College and The Lowell Institute School Schedule* for the next quarter. The *Schedule* provides you with the meeting times and locations of the courses being offered during the next quarter. To get a copy of the *Schedule*, contact The Lowell Institute School at 617-373-2500.

Changes in Registration

You can change the courses you are registered in by filing a course drop form at the registrar's office, 120 Hayden Hall, and then registering for the desired course. We suggest that you make these changes during the official registration period, if possible.

Cross-Registration

Undergraduate full-time day students registering for Lowell Institute School part-time courses may do so only to clear deficiencies or to follow a program approved by the appropriate program coordinator. Undergraduate full-time day students may register for part-time courses only by completing the registration form available in The Lowell Institute School office by the end of the first week of the quarter. You must *not* fill out any other part-time registration materials. Approval of the program coordinator must be obtained if the course does not appear on your approved program sheet. Approval from the Department of Cooperative Education is required if you take more than one course during a co-op term. Upon completion, approval, and submission of the registration form, you will be registered automatically for the course. If the course is a substitute for a day course, the latest grade received is considered for quality-point calculations. If you do not appear on the part-time roster, you will not be admitted into the class unless you have an approved registration form. In all instances, undergraduate full-time day students must adhere to the academic and administrative requirements of the part-time course.

Part-time Lowell Institute School students who have been enrolled at Northeastern University for one or more quarters are eligible to register for a limited number of undergraduate full-time day courses. This policy is designed to accommodate previous Lowell Institute School students who have experienced employment changes that make it impossible for them to continue part-time studies. If you are eligible, you may register for eight quarter hours of day course credit per quarter for a maximum of three academic quarters. Since you will be a part-time evening student in undergraduate full-time day courses, tuition, fees, student services, and space availability will be based on part-time rates and departmental policy. If you are interested, you must first determine if a specific course is offered in the University, complete the registration form in The Lowell Institute School, and have the form approved in both the bursar's and registrar's offices. At this point the academic department will determine space availability.

Academic Standards

Campus Locations

All courses are offered at the main campus in Boston, with some courses available at the Burlington and Dedham campuses.

Quarter Calendar

Northeastern University operates on a quarter-system calendar. All courses are evaluated in terms of quarter-hour credit. A quarter-hour credit is equal to three-fourths of a semester-hour credit.

Class Session

Classes at Northeastern are scheduled in different modules. In assessing quarter-hour weight for courses, the following statement applies: One quarter hour of credit is equal to approximately fifty minutes of instruction per week, plus two hours of individual study.

Coursework

Various methods of instruction will be used in the course of your studies: lectures, home assignments, class projects, laboratory work, irregularly scheduled quizzes, and formal examinations. In addition, you will complete midterm examinations in most courses and a final examination at the completion of all courses. You are responsible for fulfilling all the requirements of a course. In the event of absence, you must make appropriate arrangements for makeup with the instructor.

Attendance

Chronic absence from regularly scheduled sessions in any subject, for whatever reason, may seriously jeopardize your academic progress and status. You are expected to attend all sessions scheduled in your courses. Excessive absence during a quarter may be sufficient cause for the registrar to remove the course(s) from your schedule.

Withdrawal

Students who wish to withdraw from a course must complete a Course Drop Form, available from the registrar representative at any campus location. Ceasing to attend classes or notifying the instructor does not constitute official withdrawal from a course. Students who withdraw from a course prior to the end of the seventh week of a term (please refer to the specific deadline in each *Schedule Guide*) will have no record of the withdrawal on their transcripts. Students may withdraw from the beginning of the eighth week to the end of the week prior to final examinations, but the withdrawal will be noted on their transcripts. No withdrawals will be allowed for any reason during the week that final examinations are given.

In addition, the registrar will withdraw you from a course if you do not attend the first three classes at the beginning of the quarter or the first two classes at the beginning of a summer term.

Grading Systems

You are required to maintain appropriate grades, quality-point average, and the quantitative credit requirements of your program to satisfy academic progress criteria and graduate from The Lowell Institute School.

The following grading system is used. The numerical equivalent for each grade is in parentheses.

A	(4.000)	Outstanding attainment
A–	(3.667)	
B+	(3.333)	
B	(3.000)	Good attainment
B–	(2.667)	
C+	(2.333)	
C	(2.000)	Satisfactory attainment
C–	(1.667)	
D+	(1.333)	
D	(1.000)	Poor attainment
D–	(0.667)	
F	(0.000)	Failure
I	—	Incomplete (letter-graded course)
L	—	Audit (no credit)
S	—	Satisfactory achievement in a pass-fail course; counts toward degree requirements
U	—	Unsatisfactory achievement in a pass-fail course
W	—	Course withdrawal
X	—	Incomplete in a pass-fail course
*	—	Grade not received

A general average of D is unacceptable and will not allow you to continue in The Lowell Institute School or to receive a degree from Northeastern University. If you receive an F, you can clear the failure by repeating and passing the course.

Pass/Fail Courses

If you are a *degree candidate* in good academic standing and have completed forty quarter hours in a Lowell Institute School degree program, you may register for one pass/fail course. Thereafter, you may register for one course on a pass/fail basis for each ten quarter hours of successfully completed work up to a maximum of nine quarter hours of pass/fail credit. You must obtain written permission from the appropriate academic dean or designee and approval of the instructor. You may not register for more than one pass/fail course per quarter. Pass/fail courses are restricted to social science/humanities electives only.

If you are a *nondegree candidate*, do not intend to become a degree candidate, and are making good academic progress, you may register for a course on a pass/fail basis with written permission from the appropriate academic dean or designee and approval of the instructor. You may not register for more than one pass/fail course per quarter.

If you become a degree candidate, you may use only nine quarter hours of social science/humanities elective credit, where applicable.

Auditing a Course

You can audit courses by filing the usual registration forms and paying the regular tuition fees. There is no reduction in fees for auditing. Your decision to audit must be communicated in writing to the registrar prior to the fourth class meeting. As an auditor, you may participate in class discussion, complete papers and projects, and take tests and examinations for informal evaluation if desired. However, regardless of the amount or quality of work completed, *no academic credit will be granted at any time for courses audited.*

Makeup Examinations

Midterms

If you are absent from a midterm examination, you may request that your instructor grant permission to take a makeup examination; you do not automatically have the right to make up a missed examination. If permission is granted, arrange to have your instructor coordinate with you and The Lowell Institute School a day and time for you to take the examination. All examinations will be administered on the Boston campus by The Lowell Institute School office, 120 Snell Engineering Center, during regular office hours. *There is no fee for a midterm makeup.*

Finals

If you are absent from a final examination, you will receive a grade of I (Incomplete) for the course. You do not automatically have the right to make up a missed final examination; you must file a petition for a missed final according to the published schedule. Petitions may be obtained from The Lowell Institute School office, 120 Snell Engineering Center, 617-373-2500. If the petition is granted, *you must pay a fee before taking the special examination.* (See enclosed Fee Schedule and Academic Calendar.)

You will be notified when and where to take the final examination; all are administered on the Boston campus. If you do not take makeup final examinations as scheduled, you will forfeit the makeup privilege.

Quality-Point Average

The quality points you earn in a given course are determined on the basis of your letter grade and the credit hours carried by the course. The total quality points earned, divided by the total number of credit hours, constitutes the quality-point average.

- 1. When you receive more than one grade in the same course, the most recent grade will be used to calculate a quality-point average.
- 2. A grade of I (Incomplete) will not be considered in the final calculation.
- 3. If you are a transfer student, you can receive advanced standing credits (ASC) for work completed at other institutions. While these credits count toward completion of degree requirements, neither the credits nor the grades earned in such courses are included in quality-point averages.
- 4. In programs made up of combined University College and The Lowell Institute School courses, your cumulative quality-point average will include all work in both colleges.

For example, if you have registered for thirteen courses, cleared a failure in one of them, cleared an incomplete in another by repeating the course, and received advanced standing credit in another, you may calculate the quality-point average as follows.

Grade Achieved	Numerical Equivalent	×	Credit Hours	=	Quality Points
A	4.000	×	4	=	16.000
A-	3.667	×	3	=	11.001
B+	3.333	×	3	=	9.999
B	3.000	×	4	=	12.000
B-	2.667	×	2	=	5.334
C+	2.333	×	2	=	4.666
C	2.000	×	4	=	8.000
C-	1.667	×	3	=	5.001
D+	1.333	×	2	=	2.666
D	1.000	×	3	=	3.000
D-	0.667	×	2	=	1.334
F	0.000	×	2	=	0.000
FB	3.000	×	3	=	9.000
I	-	×	-	=	-
IC	2.000	×	2	=	4.000
ASC	-	×	-	=	-
			Totals 39		92.001

QPA = $\frac{\text{Total Quality Points (92.001)}}{\text{Total Credit Hours (39)}} = 2.359$

The registrar cannot confirm calculations of quality-point averages. Each student's record is updated before graduation. In the meantime, borderline cases can be checked by a Lowell Institute School counselor.

Grade Reports

The registrar's office will mail you a grade report that indicates both the quarterly quality-point average and the cumulative quality-point average. University regulations prohibit issuing grades by telephone.

Academic Progress Criteria

You are expected at all times to strive for a high record of achievement. The Academic Standing Committee reserves the right to review all students' records and deny readmission to those who fall below a minimum quality level of achievement. This requirement has been established as follows.

To remain in the college, you must have a quality-point average of at least 1.40 at the completion of twenty-four quarter hours, 1.50 at the end of forty-eight quarter hours, and 1.60 at the end of seventy-two quarter hours.

If you accumulate the equivalent of six uncleared failures, you may be considered ineligible to continue your program of study.

Scholastic Probation

The Academic Standing Committee has the authority to dismiss from the school or to place on scholastic probation any student whose scholarship is deficient because of a low quality-point average or excessive outstanding failures, regardless of quality-point average.

A student on scholastic probation should be particularly diligent in current coursework and make every effort to clear the academic deficiencies as soon as possible. Students whose academic records do not improve or whose failures are not properly cleared may not be allowed to register for further courses.

A student on scholastic probation who has cleared all or a substantial part of any outstanding failures may petition the Academic Standing Committee for removal from the probation list.

Disciplinary Probation

The Academic Standing Committee has the authority to dismiss from the school or place on disciplinary probation any student who is deemed unworthy because of conduct or character. The committee may ask any student to withdraw from the school who is obviously out of sympathy with its aims and ideals.

Graduation Requirements

To receive the degree of associate in engineering, associate in science, or bachelor of science in engineering technology, you must meet the following requirements.

1. Formal acceptance into degree candidate status by the Committee on Admissions.
2. Completion of all curriculum courses, either by attendance at the School of Engineering Technology/The Lowell Institute School or by receiving advanced standing credit.
3. Completion of associate degree programs within eight years and bachelor's programs within twelve years from the date of entrance into the School of Engineering Technology/The Lowell Institute School (extensions of time may be granted by the Academic Standing Committee).
4. Attendance for at least a year preceding the expected graduation date, and completion of at least one-fourth of the work in the School of Engineering Technology/The Lowell Institute School.
5. Maintenance of a minimum quality-point average of 2.00 in all courses in the major and a minimum overall quality-point average of 2.00.
6. Completion of additional credit amounting to at least one-fourth of the total hours required to be awarded more than one associate or bachelor degree.
7. You must petition for transfer of credits completed at other institutions prior to January 1 of the year in which you are to receive the degree.

Academic and Professional Awards

The academic programs offered by the School of Engineering Technology/The Lowell Institute School and the teaching, counseling, and professional efforts of the faculty and staff are aimed at motivating you toward the highest levels of academic achievement. To encourage scholarly and professional excellence and to recognize quality achievements, the following awards are made at appropriate times during the academic year.

Dean's List Scholars

All matriculated students maintaining honor grade averages—a minimum quality-point average of 3.00 and no grades below C during a quarter, while carrying a minimum of eight quarter hours of credit—are recognized as Dean's List Scholars. If you want a certificate attesting to this honor, contact The Lowell Institute School office.

Graduation with Honor

Bachelor's degree candidates who have superior achievement will be graduated with honor, high honor, or with highest honor, depending on the final quality-point average as follows.

Graduation with honor	3.25–3.49
Graduation with high honor	3.50–3.74
Graduation with highest honor	3.75–4.00

To be considered for graduation with honor, a student must have completed a minimum of 72 quarter hours of work at the School of Engineering Technology/The Lowell Institute School. Courses transferred from other educational institutions will not be considered in determining honor graduates.

Awards

Technology Awards

The Technology Awards are presented annually to seniors pursuing associate degree programs who have achieved high-ranking cumulative academic records. Certificates are awarded at the annual Class Day Ceremony.

University Awards

The University Awards are presented annually to seniors pursuing baccalaureate degree programs who have demonstrated superior academic and professional capabilities in their fields. Appropriate certificates are distributed to outstanding students enrolled in the following program categories.

Aerospace Maintenance Engineering Technology
Computer Technology
Electrical Engineering Technology
Mechanical Engineering Technology
Mechanical Engineering Technology with a Concentration in Manufacturing

Class Marshal Award

The Class Marshal Award is presented annually at the Class Day Ceremony to the top-ranking senior in a baccalaureate program. The award consists of a certificate and the President's Letter of Commendation.

Sigma Epsilon Rho Awards

This award is presented annually by Sigma Epsilon Rho, the evening colleges' scholastic honor fraternity. The highest-ranking students in University College and The Lowell Institute School receive certificates and pins for outstanding scholastic achievement.

Tau Alpha Pi Awards

This award is presented annually by the Tau Alpha Pi National Engineering Technology Honor Society to recognize high scholastic achievement among students of the School of Engineering Technology/The Lowell Institute School. The award is intended to promote and encourage outstanding academic performance by offering membership in the society. Finally, the society hopes the award will strengthen the desirable qualities of personality, intellect, and character among its members. Inductees receive certificates and pins.

Alumni Award for Professional Promise

Established in 1947 by the Northeastern University Alumni Association, the Alumni Award for Professional Promise is presented annually at the Class Day Ceremony. The award is made to the senior who has demonstrated unusual professional promise through character traits, scholastic achievement, and professional performance.

Additional Opportunities at Northeastern

Educational Opportunities at Northeastern for Associate's Degree Graduates

Graduates of associate's degree programs in engineering technology or science technology may be able to transfer applicable credits toward the degree requirements of a baccalaureate program in engineering technology or operations technology at Northeastern.

For information about transferring associate's degree credits toward an engineering technology bachelor's degree, call The Lowell Institute School, 617-373-2500. For information about transferring associate's degree credits toward an operations technology bachelor's degree, call University College, 617-373-2400.

In addition, engineering technology or science associate's degree graduates who maintained a quality-point average (QPA) of 2.75 may be able to transfer applicable credits toward a bachelor of science in engineering degree. For information, call the College of Engineering's student services office, 617-373-2154.

Educational Opportunities at Northeastern for Bachelor's Degree Graduates

Bachelor of science in engineering technology graduates who maintained a quality-point average (QPA) of 2.75 may be qualified to enter the College of Engineering's program leading to the bachelor of science in engineering degree. For information, call the College of Engineering's student services office, 617-373-2154.

Financial Information

Tuition and Fees

For actual fee amounts, refer to the enclosed Fee Schedule and Academic Calendar. If you do not have a Fee Schedule and Academic Calendar, you can request one by calling 617-373-2500.

Tuition rates, all fees, rules and regulations, courses and course content are subject to revision by the President and the Board of Trustees at any time.

Registration and Tuition Fees

As a new student, you will be charged a one-time, nonrefundable registration fee. This fee is included on your tuition bill.

Full payment of tuition and other related charges is due by the beginning of each quarter. The following are accepted methods of payment.

- Check or money order made payable to Northeastern University.
- MasterCard, VISA, or Discover. Payments may be made in person or by calling our 24-hour automated charge line, 617-373-2319 or 800-937-4067.
- Enrollment in the Three Payment Option plan, described below.

Students are responsible for the prompt payment of all bills. If you have not received a bill by the first week of the quarter, stop by the Bursar's Office, where a bill will be created for you.

Any discrepancies in your bill should be brought to the attention of the Bursar's Office. If there is a billing problem, pay the undisputed portion of the bill to avoid any late fees.

Three Payment Option

Northeastern University offers a three payment option plan. For information regarding this plan, contact the Bursar's Office, 617-373-2270 or 617-373-3881 (TTY). There is a nominal fee for participation in this program.

Applications along with the initial payment of one-third tuition plus the fee are due at the beginning of the quarter. Check with the Bursar's Office for specific deadline dates.

Delinquent Balances

In cases of student default on tuition payments, the student is liable for the outstanding tuition, as well as all reasonable collection costs and any legal fees incurred by the University during the collection process. Outstanding balances may be subject to monthly interest charges.

Transcripts and other academic records will not be released until all financial obligations to the University have been met.

Refund of Tuition

Tuition refunds may be granted through the first four weeks of a quarter based on the official withdrawal application filed with the Registrar's Office. Nonattendance does not constitute official withdrawal. Credit balances will be applied to future charges, unless the Bursar's Office receives other written instructions.

Refunds will be granted according to the following schedule.

<i>Official withdrawal filed within</i>	<i>Percentage of tuition refunded</i>
1st week of quarter	100%
2nd week of quarter	75%
3rd week of quarter	50%
4th week of quarter	25%
5th week of quarter	0%

A different refund schedule may apply to courses that run less than a full quarter.

Tuition Paid for by Employers

In cases where payment is made directly by the employer to the University, the student must give the Bursar's Office a purchase order or a statement from an officer of the company, certifying that the company will pay the University directly. If there are stipulations associated with the payment agreement, such as a minimum grade level, then the student must pay the University directly or enroll in the Three Payment Option plan.

Tuition Reimbursement

Many companies do not pay the University directly but will reimburse employees upon successful completion of each course. In such cases, students are responsible for payment in full at the start of each quarter or may select the Three Payment Option plan. Tuition may not be left unpaid pending employer reimbursement. Failure to make payments in accordance with these regulations will result in a late payment fee.

Student Center Fee

If you attend the main Boston campus in the evening in a part-time program of study, you will be assessed a nominal Student Center fee.

Parking Stickers

Parking is available in designated University parking areas. Once a parking sticker is paid for at the Cashier's Office in 248 Richards Hall, it can be picked up at the Traffic Office in 100 Forsyth Building.

Health Service Waiver Process

The Commonwealth of Massachusetts requires all Northeastern University students who are classified as full-time or are enrolled in a degree program carrying nine or more credits to be covered by hospital insurance. In compliance with the law, Northeastern University automatically enrolls you in its insurance plan and charges \$795 to your student account for this coverage. Students who are covered by comparable medical insurance may waive the University-offered insurance program by filing a waiver. Medical insurance waiver forms, available at the Bursar's Office, 254 Richards Hall, must be filed by the deadline dates. A waiver form must be completed annually at the start of each academic year. *Waivers submitted after the deadline will not receive a full reversal of the health fee.*

Proficiency Examination Fee

Applicants may petition for advanced standing credit based on a "proficiency examination." There is a fee for each examination requested.

Transcript Fee

You can obtain an official transcript at the registrar's office, 117 Hayden Hall. The official transcript fee is payable in advance at the

cashier's office, 248 Richards Hall. You must present a current picture identification card to obtain your transcript. Transcripts and other academic records will not be released until all financial obligations to the University have been met.

Textbooks and Supplies

You must purchase your own textbooks and work materials. The cost varies according to the subject. If you are enrolled in Engineering Graphics, you should be prepared to purchase drawing supplies and a set of drawing instruments, in addition to the textbook. If you are enrolled in a mathematics course, you should be prepared to purchase a graphing calculator, such as the TI-85, in addition to the textbook.

Financial Aid and Scholarships

The Office of Financial Aid, located at 356 Richards Hall, offers several types of assistance to part-time students. All awards are based on financial need. Aid granted from programs sponsored by the federal or state government is dependent upon the amount of funding allocated to Northeastern University. Federal regulations require that students who receive financial aid funds be United States citizens or permanent residents.

Application Procedure

All students applying for aid must submit a Free Application for Federal Student Aid (FAFSA) to the federal processor.

Federal regulations require that students submit a Financial Aid Transcript (FAT) from each school they have previously attended to the Office of Financial Aid before they can receive financial aid at Northeastern. This is required even if you did not receive aid at the other institution(s). If your transcript indicates you are in default on a loan or you owe a refund, you will be ineligible for all types of financial aid until this status is cleared.

Northeastern University also requires its students to complete an Institutional Application. This form gathers information that assists the office in determining a student's eligibility for aid.

All application materials are available at the Office of Financial Aid. Students should begin the application procedure at least twelve weeks before the start of the quarter in which they

plan to enroll. Students must apply for financial aid each academic year.

In order to be eligible for financial aid, students must be admitted into a degree program prior to the beginning of the academic quarter. Students admitted after the start of the quarter will not be eligible for aid until the next academic quarter.

First-year students must submit a Letter of Provisional Matriculation from The Lowell Institute School. A Letter of Provisional Matriculation is valid for one year. At the conclusion of the year, students must be officially admitted into a degree program in order to retain eligibility for aid.

Satisfactory Academic Progress

For all students who are receiving financial aid for the first time on or after July 1, 1987, satisfactory academic progress will be determined based on having achieved a 2.0 QPA after the completion of the second grade level and maintaining that minimum until completion of the degree. Students not achieving a 2.0 QPA or dropping below that minimum after their second grade level will not, by Federal law, be eligible for financial aid.

Financial Aid Programs

Financial aid to students is offered in the form of loans and grants. Available programs follow.

Federal Pell Grant

Based on a student's financial information, a student may be eligible for a Federal Pell Grant. The Federal Pell Grant Program is a federal aid program designed to provide financial assistance to undergraduate degree candidates. Approximately six weeks after a student has filed the FAFSA, the federal processor will send the student a Student Aid Report (SAR). The SAR must be submitted to the Office of Financial Aid to have a student's eligibility determined.

This program requires a student to be admitted into a degree program. If eligible for a Federal Pell Grant, the amount of the grant will vary depending upon the number of quarter hours a student enrolls in each quarter. Students with a prior bachelor's degree are not eligible to receive Federal Pell Grants.

State Scholarships

Based on financial information, a full-time student may be eligible for a state scholarship. When submitting the FAFSA, be sure to answer all questions regarding residency. Most states have application deadlines. Eligibility for state scholarships is based on need and is determined by the scholarship office in each state. Students will receive a letter from the state scholarship office notifying them of their eligibility. In order to be eligible for a state scholarship, a student must be admitted into a degree program and enrolled in at least twelve quarter hours per quarter. A student with a prior bachelor's degree is not eligible to receive a state scholarship. Contact your state scholarship office for more information.

Federal Stafford Loan Programs

Federal Stafford Loans are low-interest student loans available to students admitted to a degree program and enrolled on at least a half-time basis. Maximum loan levels are \$2,625 for the first year of study; \$3,500 for the second year; and \$5,500 for the third and subsequent years of undergraduate study. The maximum loan limit for undergraduate students is \$23,000.

In order to have a loan processed by the financial aid office, a student must have a complete financial aid application on file, have received a letter of eligibility from Northeastern, and have submitted a Federal Stafford Loan application. Applications for the loan are available from local lending institutions and the Office of Financial Aid.

Eligibility to participate in the **subsidized** Stafford Loan program is based on need in accordance with federal regulations. The federal government pays the interest on the loan while the student is in school. Repayment begins six months after enrollment falls below half-time.

Unsubsidized Stafford Loans are available to students who do not qualify financially for the subsidized loan. The unsubsidized loans are identical to the subsidized loans except that the federal government does not pay the interest on the loan while the student is in school. The student either makes regular interest payments or the interest is added to the loan's principal. Repayment begins six months after enrollment falls below half-time.

Repayment on loans may be deferred under certain circumstances. For details, contact your lender.

Students who borrow funds through this program must report any of the following changes to their lenders:

- withdrawal from school
- transfer to another school
- reduction of course load to less than half-time
- change of address or parents' address
- change of name

Additional information about financial aid is available from the Office of Financial Aid, 356 Richards Hall, 617-373-3190.

All federal financial aid programs are subject to change depending on adequate and continuing federal support.

Community Sources

Students and their families are urged to explore community, industrial, and foundation sources for collegiate financial aid. Parents' employers or the appropriate union organization may be a source. In addition, local, civic, political, religious, or educational leaders are often aware of aid sources in the immediate community. Some typical sources include PTA, Kiwanis, Lions, Elks, Knights of Columbus, Masons, Sons of Italy, Rotary, State Rehabilitation, or the American Legion.

Veterans' Benefits

Veterans covered by the Veterans Readjustment Act of 1966, Public Law 89-358, should report to 120 Hayden Hall to fill out the proper enrollment forms. Benefits depend on course load and increase sharply when a student takes more than eight quarter hours per quarter.

Students needing additional information about eligibility, allowances, or other details are urged to contact the local office of the Veterans Administration or the Veterans' Benefits Representative at 120 Hayden Hall, 617-373-2183.

Scholarships and Application Procedures

The Lowell Institute School and University College scholarships and awards that follow are available to students who have been accepted as degree candidates and are in good academic standing.

Scholarships are awarded once a year by the Scholarship Committee. Final selection of scholarship recipients is usually made in late June, followed by the awarding of the scholarships in late July. Funds are usually applied to tuition expenses for the following academic year. Awards range in amount from \$300 to \$1,000.

In January, a mailing list of students who have requested applications is prepared, and applications are mailed out with the stipulation that they be completed and returned to the Scholarship Committee by March 31. To be placed on the January mailing list, call 617-373-2500 and leave your name and address.

The Lowell Scholar's Program

Established by the Lowell Foundation in 1996 to support students in The Lowell Institute School at Northeastern. Preference will be given to former Lowell Institute School at MIT students, on the basis of financial need, academic achievement, and availability. Awards will be granted to support study toward certificates as well as associate's and bachelor's degrees offered by The Lowell Institute School at Northeastern, a division of the School of Engineering Technology. Awardees will be designated as Lowell Scholars. This scholarship is granted on a quarter-by-quarter basis, and application must be made one month prior to the beginning of each quarter.

Leslie B. Cutler Aviation Scholarship Awards

Established by the members of the Aero Club of New England in recognition of the late Senator Cutler's service and devotion to the interests of aviation, these awards are made to students who most typify the same interest, devotion, and leadership demonstrated by Senator Cutler during her long and distinguished public career.

Henry J. Doherty Memorial Scholarship Fund

Established in 1987 through the generosity of Doris R. Doherty as a tribute to her late husband, a 1953 graduate of the School of Business's evening program and a successful business leader in legal publishing. The income from the scholarship is awarded annually to deserving students with demonstrated financial need who are pursuing part-time evening study and have been accepted as degree candidates.

Kappa Tau Phi Scholarships

Granted annually to the two women students in the arts and sciences, business, and engineering programs who rank highest at the end of the upper-middle year. If the chosen student is eligible for an award of greater monetary value, the award will be made to the next highest-ranking woman student. To be eligible for this scholarship, the student must be enrolled in a course that meets at least two evenings per week and must be a candidate for the bachelor's degree. In determining the recipient, grades of all courses completed in prior years shall be considered.

Robert G. Keene Memorial Scholarship Fund

Established in 1979 in memory of Robert G. Keene, a graduate of Lincoln College (now The Lowell Institute School), Class of 1972, the endowment funds were provided by the friends and associates of Robert G. Keene and the Polaroid Corporation, where he served as an engineering manager. The income from the fund is awarded annually to an undergraduate in any college of the University who demonstrates financial need as well as strong character and initiative. Primary consideration will be given to children of Polaroid employees.

Martin Luther King, Jr., Scholarships

Established in 1969 in memory of the late Rev. Martin Luther King, Jr., awards are made, as openings occur, to minority-group adults who would otherwise be unable to continue their education. Stipends will cover tuition expenses not to exceed six quarter hours in any academic quarter (excluding the summer quarter).

William J. McGovern Memorial Scholarship

Established in 1978 by an anonymous donor who wishes to assist others in realizing their potential through higher education and to honor the memory of William J. McGovern. The income from this scholarship will benefit worthy undergraduate students actively pursuing studies in The Lowell Institute School or University College. Recipients must be matriculated, demonstrate financial need and academic achievement, and exhibit a high level of professional promise.

Sigma Epsilon Rho Honor Society Scholarship Award

Established in 1974 by the membership of the society. Income from the fund is awarded annually to undergraduate student(s) of The Lowell Institute School and/or University College at Northeastern University. Eligible students must have a cumulative quality-point average of 3.00 or better after completing 80 percent or more of the required studies. Preference is given to spouses and children of Sigma Epsilon Rho members.

H. Patricia Taylor Scholarship Fund

Established in 1974 by H. Patricia Taylor, a graduate of University College, and her husband, Harry C. Taylor, a graduate of the School of Business, the scholarship expresses their appreciation for financial assistance made available to Mrs. Taylor while obtaining her degree, and is an attempt to provide similar funds to assist others in realizing potential through higher education. The income from the scholarship fund will be awarded annually to a student enrolled in University College or The Lowell Institute School who demonstrates financial need and academic stability and who meets certain other conditions of eligibility.

University College and The Lowell Institute School Faculty Society Memorial Scholarship Awards

The Faculty Society of University College and The Lowell Institute School offer two awards annually, primarily for excellence in studies, to bachelor's degree candidates in University College and The Lowell Institute School who have carried and are currently carrying a minimum of twenty-four quarter hours annually. Applications, available during the winter quarter, must be returned before the spring quarter. These awards are given in commemoration of the Faculty Society's deceased members.

Mark Caldwell Whitney Memorial Scholarship

Established in 1981 by the family and friends of the late Mark Caldwell Whitney, an outstanding 1973 graduate of aeronautical technology. Income from the fund is awarded annually to a student with financial need who demonstrates academic stability. Preference shall be given to students interested in the aviation field or who are preparing for careers in transportation.

Appendix



Faculty

A listing of the faculty of the School of Engineering Technology/Lowell Institute School follows.

William E. Cole, PhD

Associate Professor
Mechanical Engineering Technology

Leonard F. Dow, MS, PE

Academic Specialist, Program Coordinator
Computer Technology and Electrical Engineering
Technology

Samuel Fine, MD

Professor
Electrical Engineering Technology

David S. Goldman, MS, PE (CA, MA, NH)

Associate Professor
Computer Technology

John E. Hajjar, PhD

Assistant Professor
Computer Technology

Eric W. Hansberry, MS

Associate Professor
Design Graphics

George F. Kent, MS, MBA, PE (CT, MA)

Associate Professor, Program Coordinator
Mechanical Engineering Technology

Jerome Tapper, BSEE, PE

Lecturer
Electrical Engineering Technology

A listing of The Lowell Institute School's part-time faculty follows. Each entry gives the faculty member's name; highest degree earned; professional affiliation; and University title, department, and year of appointment.

Mohamed A.M. Abdulla, MSEE

Research Assistant, Northeastern University
Associate Lecturer, Computer Technology (1994)

Iqbal Ahmed, PhD

Project Manager, GEI Consultants, Inc.
*Associate Lecturer, Mechanical-Structural
Engineering Technology (1994)*

David J. Allen, MSCE

Consulting Engineer
Lecturer, Computer Technology (1985)

Arnold W. Almquist, MEd

Mathematics Instructor, Needham High School
Senior Lecturer, Mathematics (1967)

Francis M. Antczak, BSEE

Senior Engineer, Mass. Electric Co.
Lecturer, Electrical Engineering Technology (1985)

Maureen P. Berggren, MEd

Mathematics Teacher, Quincy High School
Senior Lecturer, Mathematics (1965)

Jan W. Beseler, MS

Control Systems Engineer, General Electric
Associate Lecturer, Computer Technology (1993)

Wayne M. Bethoney, BS

Mechanical Engineer, AMMRC
Lecturer, Mechanical Engineering Technology (1982)

Richard Bjorkman, BA

Transition Counselor, Lowell Institute School
Lecturer, Mathematics (1978)

Rosanne L. Bogan, MS

Software Engineer, Genzyme
Associate Lecturer, Computer Technology (1994)

Azzouz Boulououar, MSEE

PhD Student, Northeastern University
Lecturer, Computer Technology (1987)

James Brown, MBA

Consultant, Custom Consulting
*Lecturer, Manufacturing Engineering Technology
(1983)*

Thomas J. Bugos, PhD

Senior Software Engineer, Vmark Software, Inc.
Lecturer, Computer Technology (1985)

Vincent K. Butler, MS

Network Manager, NYNEX
Lecturer, Computer Technology (1982)

Robert W. Case, PhD

Coordinator for Day Mathematics, School of
Engineering Technology
Senior Lecturer, Mathematics (1976)

Joan M. Chrusciel, MEd, MA

Retired

*Senior Lecturer, Mathematics (1980)***Wendell R. Collymore**

Retired

*Senior Lecturer, Engineering Graphics (1976)***Roger T. Connor, MEd**

Retired

*Senior Lecturer and Course Consultant, Calculus and Differential Equations (1953)***Robert J. Cormier, BS, Registered Landscape Architect (CT, MA, NY, RI)**

Site Planner and Landscape Architect, Self-Employed

*Lecturer, Architectural Engineering Technology (1984)***James B. Corscadden, MEd, AMT**

Retired

*Senior Lecturer, Mathematics (1967)***William L. Crenshaw, MSME, PE**

Senior Mechanical Engineer, US Army Materials and Mechanics Research Center

*Senior Lecturer, Mechanical Engineering Technology (1978)***David C. Crockett, MSME**

Senior Engineer, Raytheon Equipment Division

*Senior Lecturer, Mechanical Engineering Technology (1969)***Gregory Czarnowski, MEd**

Marketing and Advertising Consultant

*Lecturer, Technical Communications (1982)***Thomas R. Deveney, MA**

Principal, Thomas J. Kenny School

*Senior Lecturer, Mathematics (1965)***Jane E. DeVoe, MA**

Senior Lecturer in Mathematics, Northeastern University

*Senior Lecturer, Mathematics (1980)***Douglas H. Diamond, BSEE**

Program Manager, Analytical Systems Engineering Corp.

*Senior Lecturer, Mathematics (1968)***John P. Dubiel, MS**

Division Manager, Boston Edison Company

*Associate Lecturer, Electrical Engineering Technology (1995)***Henry B. Eden, BA**

Account Representative, ST Associates, Inc.

*Senior Lecturer, Engineering Graphics (1957)***Walter E. Engstrom, MS**

Physics Instructor, Braintree High School

*Lecturer, Physics (1985)***Adolf J. Erikson, MBA, PE (MA)**

President, A.E. Engineering Corp.

*Senior Lecturer, Engineering Graphics (1966)***Joseph L. Finigan, MEd**

Math Department Head, A.W. Coolidge Middle School

*Senior Lecturer, Mathematics (1996)***John M. Flaherty, PhD**

President, Flaherty Research

*Senior Lecturer, Electrical Engineering Technology (1976)***James J. Flannery, MS**

Manager, Technical and Sales Support, Boston Edison Company

*Lecturer, Electrical Engineering Technology (1980)***Donald W. Fogg, MSEE**

Retired

*Associate Lecturer, Electrical Engineering Technology (1989)***Mario R. Forziati, BET**

Operations Engineering Manager, Xylogics (Bay Networks)

*Associate Lecturer, Computer Technology (1990)***Thomas G. Fratto, AM**

Mathematics Teacher, Cambridge Rindge and Latin School

*Lecturer, Computer Technology (1987)***John J. Frazier, BS**

Retired

*Lecturer, Physics (1981)***Steven R. Geddis, MS**

Project Leader, Database Technical Support, Massachusetts Department of Revenue

*Associate Lecturer, Computer Technology (1992)***Bernard F. Goldstein, PhD**

Manager/Controls, Dynamics Research Corp.

*Senior Lecturer, Electrical Engineering Technology (1974)***Boris Gommerstadt, PhD**

Associate Professor, Northeastern University

*Lecturer, Mechanical Engineering Technology (1984)***Philip R. Haberstroh, MSED**

Assistant Head Master, Boston Latin School

*Lecturer, Mathematics (1981)***W. Dale Hall, SB, PhD**

Technical Staff, MITRE Corp.

*Lecturer, Mathematics (1981)***Djamel Hamiroune, MS**

Teaching Assistant, Northeastern University

Associate Lecturer, Mechanical Engineering Technology (1991)

Francis R. Hankard, MS

Retired

*Senior Lecturer and Course Consultant, Physics (1946)***Charles E. Jacob, MEd, MLS**

Retired

*Senior Lecturer, Physics (1967)***Michael E. Jammal, MS**

Principal Manufacturing Engineer, Modicon Incorporated

*Lecturer, Manufacturing Engineering Technology (1989)***Arthur W. John, MS, MBA**

Consultant

*Senior Lecturer, Electrical Engineering Technology (1968)***Peter R. Jonietz, MS**

Principal Consultant, ViaTech Inc.

*Associate Lecturer, Computer Technology (1992)***John Joseph Joyce, MEd, MA**

Director of Mathematics, Winchester High School

*Lecturer, Mathematics (1983)***Barbara Kane, MS**

Teacher, Department of Computer Education, Natick Public Schools

*Associate Lecturer, Computer Technology (1993)***Stephen M. Kane, EdD**

Associate Professor, Co-op Education, Northeastern University

*Lecturer, Mathematics (1987)***Amin Karimpour, MSEE**

Assistant Professor, Franklin Institute of Boston

*Associate Lecturer, Computer Technology (1989)***Edward V. Kelly**

Electronic Technician, Northeastern University

*Laboratory Assistant, Electrical Engineering Technology (1991)***John F. King, MBA**

Consultant

*Associate Lecturer, Manufacturing Engineering Technology (1992)***Abdelmadjid M. Lahlaf, PhD**

Project Engineer, GEI Consultants, Inc.

*Associate Lecturer, Mechanical-Structural Engineering Technology (1987)***James E. Lennox, MS**

Principal Engineer, Polaroid Corporation

*Associate Lecturer, Computer Technology (1988)***Demetre P. Ligor, MSEE, PE**

President, Applied Measurements, Inc.

*Senior Lecturer, Physics (1959)***John F. Limongelli, BSEE**

Consultant

*Associate Lecturer, Electrical Engineering Technology (1988)***Guido W. Lopez, PhD**

Professor, Daniel Webster College

*Lecturer, Mechanical Engineering Technology (1988)***Robert A. Lupi, MS**

Lecturer in Mathematics, Northeastern University

*Senior Lecturer, Mathematics (1995)***John F. Lutkevich, BBA**

Retired

*Senior Lecturer, Engineering Graphics (1956)***Michael R. MacNeil, BSBA**

Electronic Technician, Northeastern University

*Laboratory Assistant, Electrical Engineering Technology (1985)***Eliot A. Madow, BET**

Managing Associate, Coopers & Lybrand

*Lecturer, Computer Technology (1985)***Richard H. Marks, AE**

Electronic Technician, Northeastern University

*Laboratory Assistant, Electrical Engineering Technology (1996)***Vladislav Mlch**

Laboratory Technician, Northeastern University

*Associate Lecturer, Mechanical Engineering Technology (1991)***Nihar Mohanty, PhD**

Engineer, Environmental Protection Agency

*Associate Lecturer, Environmental Engineering Technology (1992)***Louis A. Moore, BSCE, RLS**

Chief Engineer, Commonwealth of Massachusetts, Land Court, Boston

*Senior Lecturer, Mechanical-Structural Engineering Technology (1972)***Wassim G. Najm, PhD**

Electronics Engineer, Volpe National Transportation Systems Center

*Lecturer, Electrical Engineering Technology (1985)***Yesugey Oktay, MS, PE (CA, MA, ME, NY)**

Engineering Services, Boston Edison Company

*Senior Lecturer, Mechanical-Structural Engineering Technology (1970)***John F. Page, BS**

Senior Consultant, Edgewater Technology

Associate Lecturer, Electrical Engineering Technology (1996)

Thomai Panagiotou, PhD

Visiting Research Associate, Northeastern University
Laboratory Assistant, Mechanical Engineering Technology (1996)

Francis A. Pepicelli, BS

Retired
Senior Lecturer, Engineering Graphics (1976)

Walter J. Phinney, MBA

Engineering Manager, Raytheon Missile Division
Senior Lecturer, Engineering Graphics (1977)

Dominic A. Piccione, MS, PE (MA, VA)

Senior Engineer, Stone & Webster Engineering Corp.
Senior Lecturer, Mechanical Engineering Technology (1966)

Richard H. Pike, MBA

Lecturer, Northeastern University
Senior Lecturer, Engineering Economy (1980)

Norman C. Poirier, MS, PE

Research Associate, Northeastern University
Senior Lecturer, Telecommunications (1966)

Dennis D. Poulin, MS

Manager of Custom System Business Unit,
 Hewlett-Packard
Lecturer, Electrical Engineering Technology (1989)

Sean P. Powers, BSET

Senior Hardware Engineer, Xyplex, Inc.
Associate Lecturer, Computer Technology (1996)

Daniel W. Pratt, MS

Mathematics Department, Boston Latin School
Senior Lecturer and Course Consultant, Mathematics through Pre-Calculus (1967)

Charles H. Price, Jr., MSEE

Retired
Senior Lecturer, Electrical Engineering Technology (1960)

Mustafiz Rahman, PhD

Process Engineer, Process Systems International
Associate Lecturer, Computer Technology (1995)

Robert Rancourt, MSEE

Electrical Engineer, MITRE Corp.
Senior Lecturer, Mathematics (1984)

William S. Ricci, MS

Materials Engineer, General Electric Aircraft Engineers
Associate Lecturer, Manufacturing Engineering Technology (1992)

William D. Ricker, BA

Programmer, Avicenna Systems Corporation
Associate Lecturer, Computer Technology (1993)

Edward P. Ricupero, MEd

Head of Mathematics Department, Everett High School
Lecturer, Mathematics (1983)

Robert J. Ritchie, BS

Retired
Senior Lecturer, Engineering Graphics (1980)

Robert A. Rosenberg, ScD

Engineering Consultant, Stone & Webster Engineering Corp.
Senior Lecturer, Mechanical Engineering Technology (1983)

Thomas E. Ruden, MS

Microwave Consultant
Senior Lecturer, Physics (1967)

Annino D. Salvucci, AS

Mechanical Engineer, Missa Inc.
Lecturer, Engineering Graphics (1983)

Ronald E. Scott, ScD

Consultant, Scott Associates
Senior Lecturer, Electrical Engineering Technology (1983)

Sid Ahmed Sfiat, PhD

Physics Lab Supervisor, Northeastern University
Associate Lecturer, Physics (1985)

John W. Shaw, BSET

Field Service Engineer, Northeast Electronics, Inc.
Lecturer, Electrical Engineering Technology (1985)

Venkat Sreenivasan, BS

Teaching Assistant, Northeastern University
Associate Lecturer, Civil Engineering Technology (1996)

Joseph E. Steffano, Sr., MS, MBA, PE (CT, MA, ME, NH, NY, PA, RI, VT), RLS (CT, MA, ME, NH, RI, VT)

Chief Engineer, Stone & Webster Engineering Corp., Infrastructure Division
Senior Lecturer, Mechanical-Structural Engineering Technology (1965)

Harold J. Stengel, SB

Secondary Teacher in Mathematics, Boston Latin School
Lecturer, Mathematics (1982)

M. Carlton Storms, MEd

Teacher, Braintree High School
Senior Lecturer, Physics (1967)

Nabil S. Sukkar, MSCE

Project Manager, American Science and Engineering
Lecturer, Mechanical-Structural Engineering Technology (1984)

Raimundas Sukys, MS

Retired

*Senior Lecturer, Electrical Engineering Technology (1962)***Donald M. Sullivan, MEd**

Mathematics Teacher, Dedham High School

*Lecturer, Mathematics (1984)***Paul A. Sullivan, BSET**

Staff Director, NYNEX

*Associate Lecturer, Electrical Engineering Technology (1990)***James Surette**

Laboratory Supervisor, Northeastern University

*Lecturer, Mechanical Engineering Technology (1990)***David G. Sveden, MEd**

Mathematics Instructor, Town of Needham

*Senior Lecturer, Mathematics (1979)***Rena L. Tobias, MA**Research and Development Technical Specialist,
Visibility, Inc.*Lecturer, Computer Technology (1985)***David K. Toebes, MSEE**

Design Engineer, Raytheon Co.

*Lecturer, Mathematics (1987)***Jean E. Tower, BS**

Technology Specialist, Wayland Public Schools

*Associate Lecturer, Computer Technology (1995)***John S. Travia, MSEE, PE**

Retired

*Senior Lecturer, Electrical Engineering Technology (1965)***Edward P. Tribuna, BET, FAA, A&P Certificate**Software Services Consultant, Digital Equipment
Corporation*Lecturer, Electrical Engineering Technology (1985)***Paul T. Tsang, MS**

Mechanical Design Engineer, Metcalf & Eddy

*Lecturer, Mechanical Engineering Technology (1988)***John F. Videler, MS**

Retired

*Senior Lecturer, Electrical Engineering Technology (1968)***Michael P. Walker, MSCE**

Structural Engineer, GEI Consultants

*Associate Lecturer, Structural Engineering Technology (1993)***Joel R. Weinstein, BSEE**

President, High Technology Marketing

*Senior Lecturer, Computer Technology (1977)***James T. Welch, MS**

Principal Engineer, Ungermann-Bass, Inc.

*Senior Lecturer and Course Consultant, Computer Technology (1977)***Richard Whalen, MS**

Teaching Assistant, Northeastern University

*Associate Lecturer, Mechanical Engineering Technology (1992)***Joseph F. Willard, BS**

Retired

*Senior Lecturer, Surveying and Highway Engineering Technology (1949)***Albert G. Wilson, MS, PE, SE (IL)**

Retired

*Senior Lecturer and Course Consultant, Mechanical Engineering Technology (1948)***Robert T. Yosca, MA, MS**

Technical Instructor, Cognex Corporation

Associate Lecturer, Engineering Probability and Statistics (1982)

Administration

Administrative Officers

C.W.P. Finn, PhD, *Director*
 Roy A. Dalsheim, BS, *Assistant Director*
 Rasma Galins, *Assistant Director*
 Susan M. Ayer, BS, *Staff Assistant*

Student Counseling Staff

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 Susan M. Ayer, BS
 Richard Bjorkman, BA
 William E. Cole, PhD
 Roy A. Dalsheim, BS
 Leonard F. Dow, MS, PE
 Rasma Galins, *Administrative Coordinator*
 David S. Goldman, MS
 Stephen M. Kane, EdD
 George F. Kent, MS, MBA, PE (CT, MA)

Committee on Regulation and Discipline

C.W.P. Finn, PhD, *Chair*
 Roy A. Dalsheim, BS
 Rasma Galins

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 Eric W. Hansberry, MS
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 George F. Kent, MS, MBA, PE (CT, MA)
 Jerome Tapper, BSEE, PE

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 Roy A. Dalsheim, BS
 Leonard F. Dow, MS, PE
 Rasma Galins
 Francis R. Hankard, MS
 George F. Kent, MS, MBA, PE (CT, MA)

Industrial Advisory Committee

Neal P. Dagle, *Training Director, Varian Ion Implant Systems*
 Paul Farris, *Consultant*

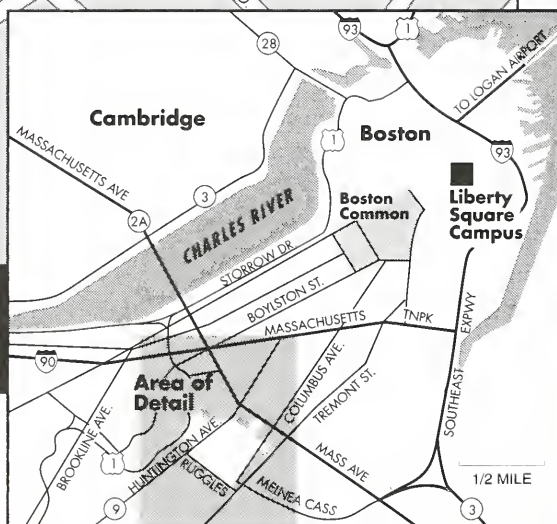
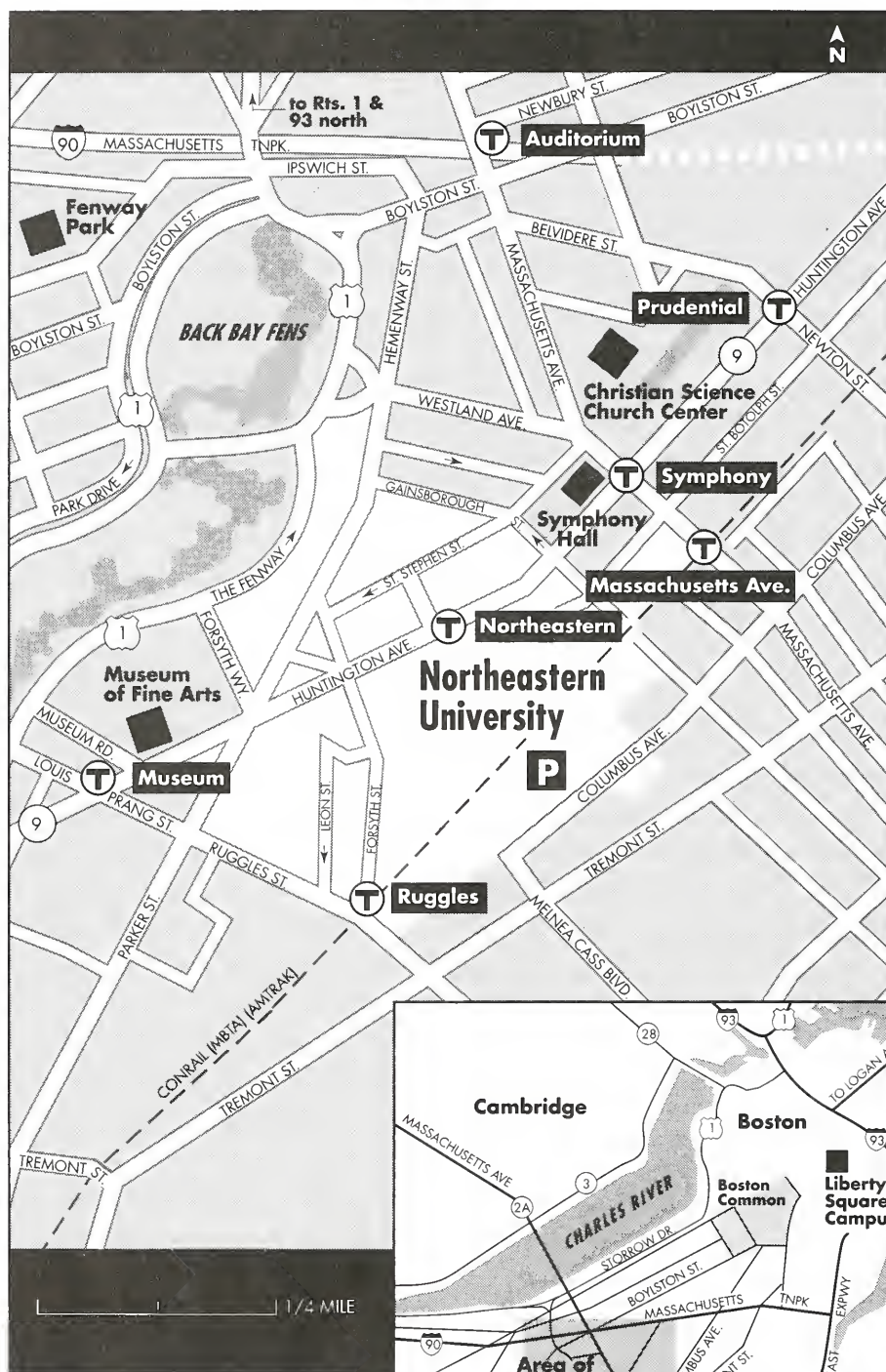
Peter F. Foley, *Manager of Operations, Industrial Heat Treating, Inc.*
 Frank Furey, *Manager, Corporate Technical Education, Polaroid Corporation*
 Rasma Galins, *Assistant Director, School of Engineering Technology, Northeastern University*
 James W. Irving, *Planning Engineer, Taunton Municipal Lighting Plant*
 Barbara Kane, *Teacher, Department of Computer Education, Natick Public Schools*
 Melvin Mark, *Consultant*
 William Nickerson, *Power Production Manager, Taunton Municipal Lighting Plant*
 William J. Smith, *Senior Manager, MCI Telecommunications Corporation*

Curriculum Advisory Committee

C.W.P. Finn, PhD (Academic Administration), *Chair*
 Rasma Galins, *Secretary*
 Susan M. Ayer, BS
 Richard Bjorkman, BA
 Robert W. Case, PhD (Course Consultant, Day Mathematics)
 Roger T. Connor, MEd (Course Consultant, Calculus and Differential Equations)
 Roy A. Dalsheim, BS
 Leonard F. Dow, MS, PE (Course Consultant, Computer Technology and Electrical Engineering Technology)
 David S. Goldman, MS (Program Consultant, Manufacturing Engineering Technology, Evening Program)
 Francis R. Hankard, MA (Course Consultant, Physics)
 Eric W. Hansberry, MS (Course Consultant, Engineering Graphics and Kinematics)
 George F. Kent, MS, MBA, PE (CT, MA) (Program Consultant, Mechanical Engineering Technology, Day and Evening Programs)
 Daniel W. Pratt, MS (Course Consultant, First-Year Mathematics through Pre-Calculus)

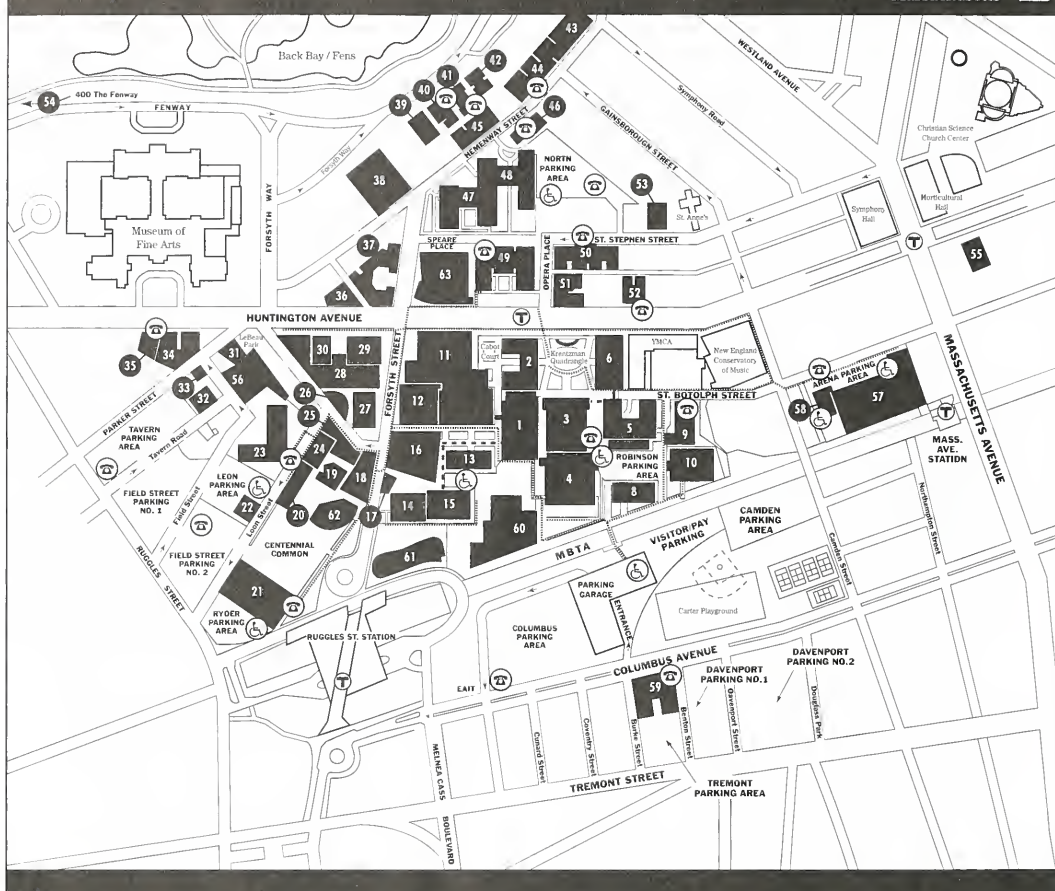
Maps

Access to Boston



Directions

From the North Route I-93 or Route 1	At the merge with Route 3 (the Southeast Expressway), take the Storrow Drive exit and proceed to the Fenway exit. Follow signs for Boylston Street Inbound, and bear right at Westland Avenue, which leads to Massachusetts Avenue. Turn right onto Massachusetts Avenue, proceed to the third traffic light, and turn right onto Columbus Avenue. The Northeastern University Parking Garage is less than one-half mile on your right at 795 Columbus Avenue.
From the West Route 90 Mass Turnpike	Take Exit 22 (Copley Square), and bear right. Proceed to the first traffic light and turn right on Dartmouth Street. Then take the next right onto Columbus Avenue. It is approximately one mile to the Northeastern University Parking Garage at 795 Columbus Avenue.
Route 9 Inbound	Proceed inbound on Route 9 until it becomes Huntington Avenue (approximately one-half mile after Brigham Circle), and take a right onto Ruggles Street. At the third traffic light turn left on Tremont Street, take the next left onto Columbus Avenue, and then turn right. The Northeastern University Parking Garage is two blocks on your left at 795 Columbus Avenue.
From the South Route 3 Southeast Expressway	Take Exit 18 (Massachusetts Avenue), and at the end of the ramp proceed straight onto Melnea Cass Boulevard. Continue for approximately two miles, and turn right onto Columbus Avenue. The Northeastern University Parking Garage is two blocks on your left at 795 Columbus Avenue.
By Public Transportation	Take the commuter rail to Ruggles Station, Back Bay Station, or North Station. From Back Bay Station, transfer to the outbound Orange Line (to Forest Hills) for two stops. Get off at Ruggles Station, which is on one side of the Northeastern University campus. From North Station, take any Green Line train to Government Center; transfer to the outbound "E" Green Line train; get off at the Northeastern University stop (the first stop above ground).



Academic and Service Buildings

- | | |
|----|--|
| 22 | Johu O. O'Bryant African-American Institute (AF) |
| 23 | Barileto Laboratory (BM) |
| 19 | Boiler Plant |
| 11 | Cabot Physical Education Building (CB) TTY: Rm 110 |
| 31 | Calmers Hall (CA) TTY Rm 151 |
| 28 | Corgill Hall (CG) |
| 33 | Critchfield Hall (CH) |
| 62 | Classroom Building (CL) |
| 9 | Columbus Place (716 Columbus Avenue) (CP) |
| 9 | Cullinane Hall (CN) |
| 40 | Cushing Hall (CU) |
| 14 | Dana Research Center (DA) |
| 27 | Dockers Hall (DX) TTY: Rm 107 |
| 6 | Dodge Hall (DG) |
| 61 | Maureen and Richard J. Egan
Engineering/Science Research Center |
| 3 | Eli Student Building (Auditorium) (EL) TTY: Rms 4, 10, 14 |
| 4 | Eli Student Center (Student Lounge) (SC) TTY: Rm 255 |
| 56 | Field Street (FS) |
| 16 | Forsyth Building (FR) TTY: Rm 100, 135 |
| 37 | Forsyth Building Annex (FA) |
| 38 | Forsyth Dental Building (FE) |
| 1 | Hayden Hall (HA) TTY: Rms 120, 202 |
| 33 | Hill-Froese (HF) |

- | | |
|----|--|
| 24 | Holmes Hall (HO) TTY: Rm 276 |
| 55 | 236 Huntington Avenue (HU) |
| 10 | Hurting Hall (HT) |
| 46 | Koroloff Hall (KA) |
| 41 | Kerr Hall (Faculty Center) (KH) |
| 29 | Knowles Center (KN) |
| 28 | Lake Hall (LA) TTY: Rm 203 |
| 63 | Robert M. and Michelle S. Marino
Resurrection Center |
| 57 | Matthews Atrium (MA) |
| 58 | Matthews Atrium Annex (MX) |
| 20 | Messerve Hall (ME) TTY: Rm 305 |
| 5 | Mugar Life Science Building
(Peabody House Professions Center) (MU) |
| 18 | Nightingale Hall (NU) TTY: Rm 125 |
| 31 | Parker Building (PA) |
| 2 | Richards Hall (RI) TTY: Rms 150, 254 |
| 8 | Robinson Hall (RB) |
| 21 | Ryder Hall (RY) TTY: Rms 170, 180, 251, 270 |
| 15 | Snell Engineering Center (SR) TTY: Rm 120 |
| 50 | Snell Library (SL) TTY: Reference Desk |
| 50 | 1225 St. Stephen Street (SS) |
| 32 | Stearns Center (ST) TTY: Rm 302 |
| 30 | 26 Tavern Road (TA) |

Residence Buildings

- | | |
|----|---|
| 34 | Burstein Hall |
| 43 | Kennedy Hall |
| 46 | 142-148 Hemenway Street |
| 45 | 153 Hemenway Street and Loftman Hall |
| 7 | 316 Huntington Avenue
(Northeastern at the YMCA) |
| 52 | 319 Huntington Avenue |
| 51 | 337 Huntington Avenue |
| 36 | 407 Huntington Avenue |
| 41 | Kerr Hall |
| 53 | Light Hall |

- | | |
|----|-------------------------------------|
| 45 | Lofmon Hall and 153 Hemenway Street |
| 42 | Melvin Hall |
| 35 | Rubenstein Hall |
| 44 | Smith Hall |
| 49 | Speare Hall |
| 48 | Stetson East TTY (public) |
| 47 | Stetson West |
| 50 | 106/110/116/122 St. Stephen Street |
| 23 | Willis Hall |
| 37 | White Hall |
| 54 | 400 The Fenway |

Key

- Academic, residential, and service buildings
- Handicap parking
- Accessible routes
- Parking areas
- Street direction
- Underground tunnel
- Emergency telephone

TTY locations
See alphabetic list of buildings
for TTY locations

Maps are provided by the Information Center, 115 Richards Hall, extension 2736 (TTY extension 3768). Some buildings on this map are used but not owned by Northeastern University 5/96

The *Lowell Institute School Bulletin* contains the University's primary statements about these academic programs and degree requirements, as authorized by the president or Board of Trustees. For information about other academic policies and procedures; student responsibilities; academic and student co-curricular life; faculty rights and responsibilities; or general personnel policies, benefits, and services, please refer to the *Academic Operations Manual*, *Undergraduate and Graduate Student Handbook*, *Cooperative Education Handbook*, *Faculty Handbook*, *Benefits and Services Handbook*, and related procedural guides as appropriate.

Accreditation

Northeastern University is accredited by the New England Association of Schools and Colleges, Inc.

Delivery of Services

Northeastern University assumes no liability for delay or failure to provide educational or other services or facilities due to causes beyond its reasonable control. Causes include, without limitation, power failure, fire, strikes by University employees or others, damage by natural elements, and acts of public authorities. The University will, however, exert reasonable efforts, when it judges them to be appropriate, to provide comparable services, facilities, or performance; but its inability or failure to do so shall not subject the University to liability.

The *Northeastern University Undergraduate Catalog* contains current information about the University calendar, admissions, degree requirements, fees, and regulations; however, such information is not intended and should not be regarded to be contractual.

Northeastern University reserves the sole right to promulgate and change rules and regulations and to make changes of any nature in its program; calendar; admissions policies, procedures, and standards; degree requirements; fees; and academic schedule whenever necessary or desirable, including, without limitation, changes in course content and class schedule, the cancellation of scheduled classes and other academic activities, and the substitution of alternatives for scheduled classes and other academic activities. In any such case, the University will give whatever notice is reasonably practical.

Northeastern University will endeavor to make available to its students a fine education and a stimulating and congenial environment. However, the quality and rate of progress of an individual's academic career and professional advancement upon completion of a degree or program are largely dependent on his or her own abilities, commitment, and effort. In many professions and occupations, there are also requirements imposed by federal and state statutes and regulatory agencies for certification or entry into a particular field. These requirements may change while a student is enrolled in a program and may vary from state to state or country to country. Although the University stands ready to help its students find out about requirements and changes in them, it is the student's responsibility to initiate the inquiry.

Tuition Default Policy

In cases where the student defaults his/her tuition, the student shall be liable for the outstanding tuition and all reasonable associated collection costs incurred by the University, including attorneys' fees.

Disability Resource Center

The Disability Resource Center provides a variety of disability-related services and accommodations to Northeastern University's students and employees with disabilities.

Northeastern University's compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 are coordinated by the Dean and Director of the Disability Resource Center. Persons requiring information regarding the Disability Resource Center should contact Dean G. Ruth Bork at 617-373-2675 (voice) or 617-373-2730 (TTY).

Emergency Closing of the University

Northeastern University has made arrangements to notify students, faculty, and staff by radio and television when it becomes necessary to cancel classes because of extremely inclement weather. AM stations WBZ (1030) and WRKO (680), and FM stations WBUR (90.9), WBMX (98.5), and WFNX (101.7) are the radio stations authorized to announce the University's decision to close. Television stations WBZ-TV4, WCVB-TV5, and WHDH-TV7 will also report cancellations. Since instructional television courses originate from live or broadcast facilities at the University, neither the classes nor the courier service operates when the University is closed. Please listen to the radio or television to determine whether the University will be closed.

If a storm occurs at night, the announcement of University closing is given to the radio stations at approximately 6 AM. Classes are generally canceled for that entire day and evening at all campus locations unless stated otherwise. When a storm begins late in the day, cancellations of evening classes may be announced. This announcement is usually made between 2–3 PM.

Equal Opportunity Policy

Northeastern University does not discriminate on the basis of race, color, religion, sex, sexual orientation, age, national origin, disability, or veteran status in admission to, access to, treatment in, or employment in its programs and activities. In addition, Northeastern University will not condone any form of sexual harassment. Handbooks containing the University's nondiscrimination policies and its grievance procedures are available in the Office of Affirmative Action, 175 Richards Hall. Inquiries regarding the University's nondiscrimination policies may be directed to:

Ellen S. Jackson, Dean/Director
Office of Affirmative Action
175 Richards Hall
Northeastern University
Boston, Massachusetts 02115
617-373-2133

Inquiries concerning the application of nondiscrimination policies may also be referred to the Regional Director, Office for Civil Rights, U.S. Department of Education, J. W. McCormack Building, Post Office Court House, Room 222, Boston, Massachusetts 02109-4557.

Family Educational Rights and Privacy Act

In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits its students to inspect their records wherever appropriate and to challenge specific parts of them when they feel it is necessary to do so. Specific details of the law as it applies to Northeastern are printed in the *Student Handbook* and are distributed annually at registration for the University's colleges and graduate schools.

Insufficient Enrollment Disclaimer

Northeastern University reserves the right to cancel any course if minimum enrollments, appropriate faculty, or academic facilities are unavailable to meet standards.

Tuition and Fee Policy

Tuition rates, all fees, rules and regulations, and courses and course content are subject to revision by the president and the Board of Trustees at any time.

Fee Schedule and Academic Calendar

The Fee Schedule and Academic Calendar has been enclosed as a separate insert to this *Bulletin*. If one has not been enclosed, contact The Lowell Institute School, 617-373-2500.

Full-Time and Day Programs

This *Bulletin* contains information about the evening and weekend programs offered by The Lowell Institute School. If you need information about full-time or day programs offered by Northeastern University, contact the Department of Undergraduate Admissions, 139 Richards Hall, 617-373-2200.

Photography: J. D. Levine and Russ Sparkman

Northeastern University
Publications
01.96.02

Northeastern University
The Lowell Institute at Northeastern
Academic Calendar 1996-1997

Fall Quarter 1996

Registration		Tuesday-Wednesday, September 3-11
Fall quarter classes begin		Tuesday, September 24
Columbus Day observed	No classes	Monday, October 14
Veterans Day observed	No classes	Monday, November 11
Make-up Day		Tuesday, November 26 Monday make-up day for LIS. Regularly scheduled Tuesday classes in these programs will not meet.
Thanksgiving recess	No classes	Wednesday-Saturday, November 27-30
Final examination period for fall quarter		Monday-Saturday, December 9-14
Christmas vacation	No classes	Monday-Sunday, December 16-January 5

Winter Quarter 1997

Registration		Monday-Thursday, December 2-5
Winter quarter classes begin		Monday, January 6
Martin Luther King, Jr.'s Birthday observed	No classes	Monday, January 20
Final examination period for winter quarter		Tuesday-Monday, March 11-17
Winter recess (or makeup period for snow days)		Tuesday-Saturday, March 18-22

Spring Quarter 1997

Registration		Monday-Thursday, March 3-6
Spring quarter classes begin		Monday, March 24
Memorial Day observed	No classes	Monday, May 26
Final examination period for spring quarter		Monday-Saturday, June 2-7
Commencement		Saturday, June 14

Northeastern University
Lowell Institute School at Northeastern
Registration Schedule 1996-1997

Each day listed in the Registration Schedule is followed by a letter code in parentheses. This code indicates the registration times for that particular day. A key for the codes is printed on the last line of the schedule.

Place of Registration	Fall 1996	Winter 1997	Spring 1997	Summer 1997
Boston Main campus*	Tuesday-Friday(b) September 3-6	Monday-Thursday(b) December 2-5	Monday-Thursday(b) March 3-6	Registration for entire summer quarter Tuesday-Thursday(b) May 27-29
	Saturday(a) September 7			Registration for second five-week term Monday-Tuesday(b) June 30 - July 1
	Monday-Wednesday(b) September 9-11			
Burlington campus*	Wednesday-Thursday(c) September 4-5	Monday-Wednesday(c) December 2-4	Monday-Wednesday(c) March 3-5	Registration for entire summer quarter Tuesday-Wednesday(c) May 27-28
	Monday-Tuesday(c) September 9-10			Registration for second five-week term Monday June 30(c)
Dedham campus*	Wednesday(c) September 4 and Monday(c) September 9	Monday-Wednesday(c) December 2-4	Monday-Wednesday(c) March 3-5	
Downtown Boston campus	Tuesday-Thursday(d) September 3-5	Monday-Wednesday(d) December 2-4	Monday-Wednesday(d) March 3-5	
	Monday-Tuesday(d) September 9-10			

(a)9:00 AM-Noon (b)9:30 AM-7:00 PM (c)5:30 PM-7:30 PM (d)11:00 AM-7:00 PM

*Counselors available at these locations only.

ADDENDUM TO 1996-1998 LOWELL INSTITUTE BULLETIN

- p. 13 Omit CT 4382 from Suggested Technical Electives
- p. 15,16 MTH 4196 should be replaced with MTH 4122
- p. 16 EET 4311 has been renamed to Digital Electronics I
- p. 16 EET 4312 has been renamed to Analog Electronics I
- p. 17 Omit EET 4360 from Suggested Technical Electives
- p. 21 MET 4395 has been renamed to Mechanical Projects Lab
- p. 21,25 Suggested Technical Elective MET 4152 should read EET 4152
- p. 21, 25 Omit EET 4324 and EET 4325 from Suggested Technical Electives
- p. 21, 25 Suggested Technical Elective MET 4481 should read Materials B
- p. 21, 25 Omit ESC 4204 from Basic Science Electives
- p. 27, 35 MET 4388 should read Measurements and Analysis
- p. 27, 35 Omit MET 4389 from course curriculum
- p. 31, 43 Omit CT 4494 from Suggested Technical Electives and course descriptions
- p. 44 EET 4314 prerequisite should be EET 4311
- p. 48 GET 4173 prerequisite should read none
- p. 48 GET 4174 prerequisite should read GET 4146 or GET 4173
- p. 53 MET 4390 has been replaced by MET 4388
- p. 53 MET 4392 prerequisite should read MET 4373 (may be taken concurrently) and MET 4388

Summer Quarter 1997

Registration for entire quarter		Tuesday-Thursday, May 27-29
Summer quarter classes begin		Monday, June 9
Independence Day observed	No classes	Friday, July 4
Registration for second five-week term		Monday-Tuesday, June 30 - July 1
Second summer quarter begins		Monday, July 14
Labor Day observed	No classes	Monday, September 1
Final examination period for summer quarter		Held during last class session each term

Fee Schedule

Tuition Related Fees	Fee
Tuition*	\$190.00 per quarter hour
Late payment fee	\$ 75.00
Student Center fee (main campus only)	\$ 8.25 per quarter

*University College courses are offered at \$165.00 per quarter hour.

Other Fees	Fee
Makeup final exam fee	\$50.00
Official transcript fee	\$ 2.00 per copy
Parking decal fee	\$40.00 per year
Proficiency examination fee	\$50.00
Registration fee (first-time students only)	\$10.00







